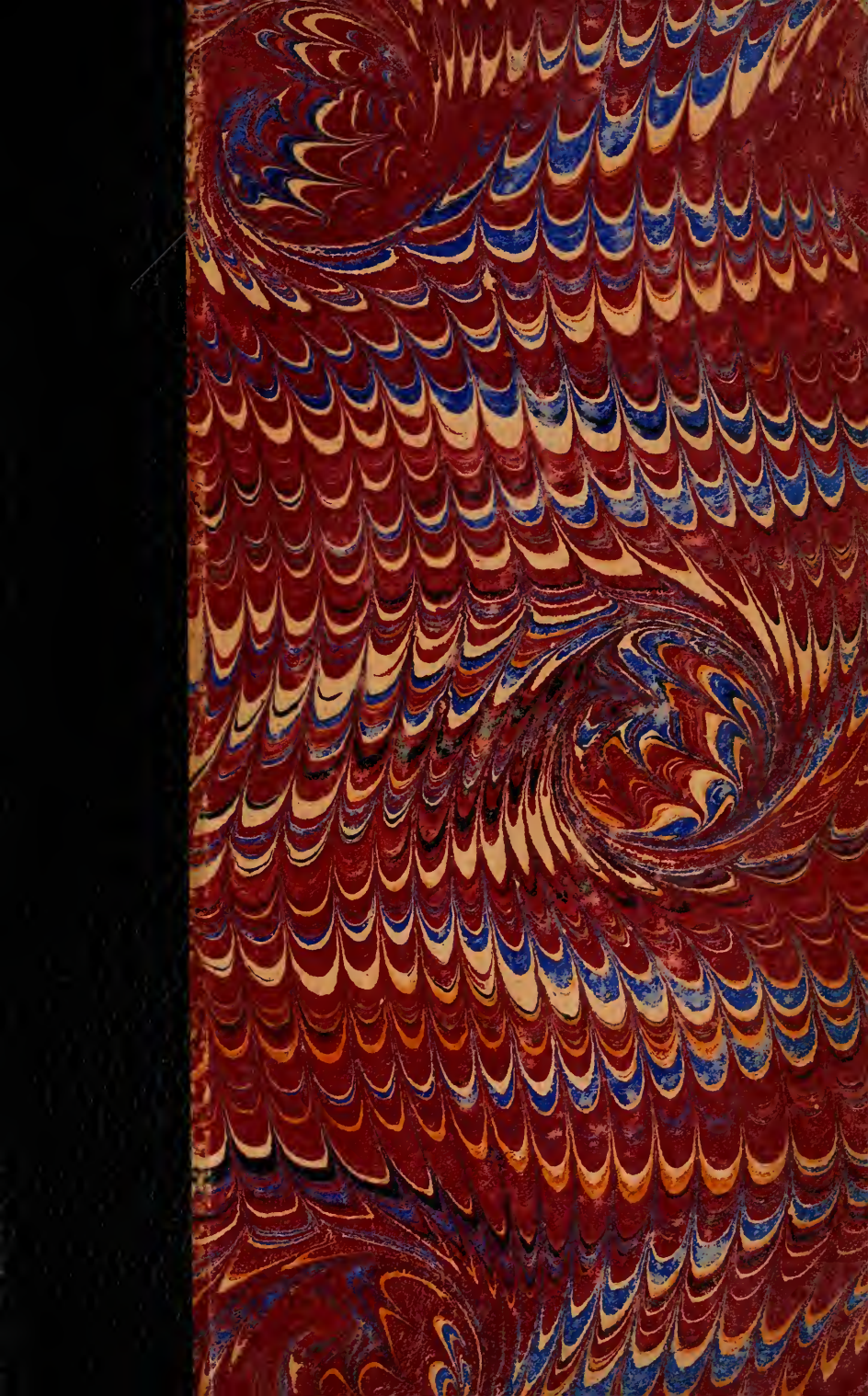

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THE

VICTORIAN NATURALIST:

THE JOURNAL & MAGAZINE

OF THE

Field Naturalists' Club of Victoria.

VOL. XXIV.

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The Author of each Article is responsible for the facts and opinions recorded.

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ERRATA.

Page 67, line 13—For "1889" read "1899."
Page 80, line 5 from bottom—After "proof" insert "correction."
Page 137, last line—For "J. C. Kershaw" read "J. A. Kershaw."
Page 140, line 21—For "*Diadosus*" read "*Diadoxus*."
Page 148, line 38—For "Wong" read "Wonga."

The Victorian Naturalist.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 8th April, 1907.

The president, Mr. F. G. A. Barnard, occupied the chair, and about 60 members and visitors were present.

CORRESPONDENCE.

From the Secretary of Public Works, in reply to a communication from the Club protesting against the wholesale slaughter of wild duck during the first few days of the shooting season, stating that "the eagerness with which the opening of the duck-shooting season is availed of causes large numbers of birds to be shot near the various centres where sport is obtainable, but it had not been shown that they were wasted; that when the season opened an unusually large number of fresh wild ducks were sold at the Melbourne market and in the streets at a moderate price, while the initial eagerness to shoot duck soon scatters the birds, and renders them difficult to obtain except by expert sportsmen. Nevertheless a large number are still to be had."

REPORTS.

A report of the Club's excursion to Kororoit Creek on Saturday, 23rd March, was given by the leader, Mr. T. S. Hall, M.A., who stated that a fair number of members attended. The afternoon was devoted to an examination of the geological features of the locality, and more particularly the occurrence, in a small cutting on the now disused Altona Bay railway, of a deposit containing recent marine shells on the top of the basalt, showing that this had at one time formed the sea bottom.

Mr. J. A. Leach, M.Sc., reported on the junior excursion to Beaumaris on Saturday, 6th April, which was attended by about 20 junior members. The object of the excursion was fossils, and a favourable tide enabled the party to see the fossil beds, with specimens *in situ*. The formation of the beds was explained, and the character of the fossils which occur there, after which some specimens of the common echinoid, *Lovenia forbesi*, sharks' teeth, &c., were collected for future reference.

LIBRARIAN'S REPORT.

The hon. librarian reported the receipt of the following donations to the library:—*Journal of Agriculture of Victoria*, vol. v., part 3, March, 1907, from Department of Agriculture, Melbourne; "Bulletins of Geological Survey of Victoria," No. 18, from De-

partment of Mines, Melbourne; *Emu*, vol. vi., part 4, from the Australasian Ornithologists' Union; *Victorian Geographical Journal*, vols. xxiii., xxiv., 1905–6, from the Geographical Society of Victoria; *Geelong Naturalist*, January, 1907, from the Geelong Field Naturalists' Club; "Forest Flora of New South Wales,' vol. iii., part 2, by J. H. Maiden, F.L.S., and "Critical Revision of Genus Eucalyptus," part 8, by J. H. Maiden, F.L.S., from the author; "Proceedings Linnean Society of New South Wales, 1906," vol. xxi., part 4, from the Society; *Nature Notes*, February, 1907, from the Selborne Society, London; "Useful Birds of Southern Australia," by Robert Hall, F.L.S., from the publisher.

ELECTIONS.

On a ballot being taken, Mr. Arthur E. Stenning, 459 Collins-street, Melbourne, was elected an ordinary member, and Masters Archie Chase Browne, Lawrence G. Travers, and Eric Harbison as junior members of the Club.

GENERAL BUSINESS.

The hon. secretary read a communication from the Inspector of Fisheries, Melbourne, requesting the opinion of the Club as to whether it is considered necessary that the Black Swan should be further protected by extending the close season for the whole year, and stating that it had been ascertained that the destruction of these birds is not excessive.

The matter was discussed by Messrs. G. A. Keartland, G. Coghill, and J. A. Kershaw, and it was finally resolved, on the motion of Professor A. J. Ewart, D.Sc., seconded by Mr. T. S. Hall, M.A.—"That the matter be postponed for further consideration, with a view to obtaining further evidence as to whether there was any noticeable increase or decrease in the number of the birds."

The president, Mr. F. G. A. Barnard, announced, regarding the proposal to recommend the imposition of a gun tax, that the question had been carefully considered by the committee at their last meeting, but in view of the small majority by which the motion was carried at the last general meeting, and the attitude of the department, as evidenced by the letter read regarding the destruction of wild duck, it was thought desirable not to proceed further in the matter at present, but await a further expression of opinion from the Club.

PAPERS.

1. By Professor A. J. Ewart, D.Sc., Ph.D., entitled "New or Rare Australian Plants in the National Herbarium, Melbourne."

The author gave a brief *résumé* of his paper, illustrating his remarks by specimens of the plants.

2. By Professor A. J. Ewart, D.Sc., Ph.D., entitled "Unrecorded Introduced Plants."

This paper, being of a technical character, was taken as read.

3. By Mr. E. O. Thiele, entitled "Further Physiographical and Geological Notes on the Mt. Wellington District, North Gippsland," with an Appendix on some Fossils by F. Chapman, A.L.S.

This paper embraced observations made during a third visit to the Mt. Wellington district, including Snowy Bluff. The author briefly described the work already done on his two previous trips to the same locality, after which an excellent series of lantern views was shown, illustrating the physical features of the country last traversed, and which were very lucidly explained by the author.

NATURAL HISTORY NOTES.

Mr. F. C. Turnell, of Hawthorn, reported having recently noticed a pure white sparrow in that district.

Mr. G. A. Keartland stated that he had observed the Flame-breasted Robin, *Petrœca phœnicea*, Gld., at Preston on 6th March last.

EXHIBITS.

By Mr. C. F. Cole.—Case of stuffed birds showing a young cuckoo, *Cuculus pallidus*, being reared in a nest of the White-plumed Honey-eater, *Ptilotis penicillata*, together with an adult bird of each species.

By Professor A. J. Ewart, D.Sc., Ph.D., Government Botanist. —*Eragrostris lacunaria*, F. v. M., true type form, and *E. rankingi*, F. M. Bailey = *E. lacunaria*, F. v. M., in illustration of paper; *Anthocercis odgersii*, F. v. M., original specimen named by Baron von Mueller, with recent specimens, also *Lachnostachys verbascifolia*, F. v. M., showing marked superficial resemblance; and *Newcastlia dixoni*, F. v. M., bearing a lesser likeness to *Anthocercis odgersii*. Specimen of Witches' Broom on *Leptospermum lævigatum*, F. v. M., from Mentone.

By Mr. G. A. Keartland.—Skin of Yellow-collared Parrakeet, *Barnardius semitorquatus*, from Western Australia.

By Mr. A. Mattingley.—Clutch of eggs of Tawny-shouldered Frogmouth, *Podargus strigoides*, from Swansea, Tasmania.

By Mr. J. P. M'Lennan.—Specimens of *Tmesipteris tannensis*, Bernhardt, from Emerald, 2/07; and *Cassinia spectabilis*, R. Brown, loc. Emerald, 3/07.

By Mr. E. O. Thiele.—Upper Ordovician Graptolites; Upper Silurian (Yeringian) Limestone with fossils, Lower Carboniferous fish scale, Rhyolite, Serpentine with common opal, and Chromite, from Mt. Wellington district, N. Gippsland, in illustration of his paper.

After the usual conversazione, the meeting terminated.

A TRIP TO MUD ISLAND, PORT PHILLIP.

By A. H. Mattingley.

(*Read before the Field Naturalists' Club of Victoria, 11th March*, 1907.)

Right in the apex of the triangle where the two marine waterways, the South and West Channels, bifurcate, near the entrance to Port Phillip Bay, and within its sheltered waters, lies a speck of land known as Mud Island. It is the nesting place of the White-faced Storm-Petrel, *Pelagodroma marina*, and a few other species, and is resorted to as a feeding ground by innumerable sea-birds, members of the wading and diving orders of birds.

To study the habits of the White-faced Storm-Petrel, known to ocean voyagers as "Mother Carey's Chickens," and also to photograph these tender little ocean sprites in the natural surroundings of their petrelry, I boarded the excursion steamer *Ozone* at Port Melbourne on Saturday afternoon, 16th February last, and proceeded down Port Phillip Bay to Queenscliff, a distance of some 35 miles. The journey was accomplished in two hours' time, despite a violent gale that was blowing. It is an ill wind that blows no one any good, and in this respect I could not complain, because I afterwards ascertained it is during a gale that one can study to advantage the avine inhabitants of Mud Island.

At Queenscliff I had arranged for a fishing craft to be in readiness to take me across the 5 miles of water which intervene between that place and the island, but owing to the stormy weather conditions the boatmen were dubious of their 6-ton boat being able to weather the gale. As I had only myself to study—being unaccompanied by any other naturalist—I pressed them to make an effort to land me on the island. After some urging they decided to yield to my solicitations, and off we started. The boat dancing merrily over the waves, borne rapidly along by a strong south-westerly gale, reached the island in about half an hour's time. Great care had to be exercised by the boatmen to prevent going ashore on the sand-banks that surround the island. They informed me that were they to run the heavily ballasted craft on to one of these banks, in the gale that was then blowing, she would go to pieces in five minutes. After careful steering through a narrow channel between the sand-banks calmer water was reached, and, having transferred myself and luggage, consisting of a bottle of water (there being no fresh water on the island), some eatables, and a blanket, not forgetting a camera, to a dinghy, we pulled close in to a mud-bank and waded ashore, sinking, in places, knee deep in mud. On reaching the sandy beach the south-westerly gale veered around to a southerly "buster," so the fishermen hurried back to their craft, and, with but a pocket-handkerchief of a sail hoisted, beat back to Queenscliff. There I

was, a stranger in a strange land—a Robinson Crusoe, as it were, alone on a desert island. But I had not ventured so far afield to idly dream, so, "swagging" my luggage, I proceeded to a hut at the south-west corner of the island, and, having placed my impedimenta inside, started off to explore.

My investigation showed the island's formation to be in the shape of a horse-shoe, with the two points to the south, whilst running across between these points was another island, separated from the main island by a shallow lagoon, which, owing to the gale, was now knee-deep in water, whilst the large areas of mud-banks which abut the island were invisible. As I walked about the edge of the lagoon thousands upon thousands of birds were seen. These birds, driven from other localities by the gale, had taken refuge in the sheltered waters of the lagoon, which had risen above its normal level about eighteen inches, owing to the high tide and the damming back of the waters of Port Phillip by the southerly gale concentrating and impeding the exit of the ebb tide through the narrow entrance at the Heads. Black Swans, *Chenopis atrata*, in hundreds were disturbed, and swam majestically away, uttering their plaintive clanging note, as ever and anon they stretched down their long, graceful necks into the water below to feed upon the Sea Grass, *Halophila ovata*, growing on the mud-bank beneath. There were no evidences, however, of these birds having nested on the island. The wading birds were clustered together in hundreds and in thousands, and lined the sheltered shore of the lagoon. The water on their feeding grounds on the mud-flats being now too deep for them to stand and search for food, being storm-swept, they had, perforce, to seek the edges of the lagoon instead, and it was indeed a beautiful sight to watch them either probing the mud or wading in the shallows in search of their prey. How tame, too, they appeared to be, and one could approach much nearer than usual, owing to having the advantage of the cover of bushes growing close to the water's edge, and so observations of their habits was rendered much easier. Had there been sufficient light several nice photos. of them could have been secured. Little Stints, Sharp-tailed Stints, Curlews, Barred-rumped Godwits, and Lesser Golden Plover were seen probing the mud for crustacean and other minute life. When disturbed the combined flocks of these last-named birds simply blackened the sky in one direction. This is not a figure of speech, but a fact.

Owing to the storm land birds were not in evidence, since they were sheltering in the clusters of thick bushes on the sand dunes. As the day was now waning, I waded across to the islet lying between the ends of the main island to inspect the homes of the White-faced Storm-Petrels. When wading I was bare-

footed, and narrowly escaped treading on a Stingray. These fish have a penchant for frequenting shallow water, and the sting of their whip-like tail is both dangerous and painful. Arriving at the petrelry or rookery, burrows apparently made by rats were seen right in the sand dune at the water's edge. Into the first one I introduced my hand, and having pushed my arm up about 18 inches I suddenly felt something wriggling. My first inclination was to withdraw my arm in response to the stimulation of the thought that it was a venomous reptile, but I was aware that no snakes inhabit the island, although a small species of lizard is found there, so, reassured, I seized the soft, wriggling object, and carefully pulled it out of its burrow. It was a very young White-faced Storm-Petrel, resembling a ball of slaty-grey fluffy down, out of which peeped a pair of little beady black eyes, from just behind a slender black beak, surmounted by the tube nostrils peculiar to the petrel family.

Replacing the tender little creature back in its burrow, several more burrows were investigated, when I found young birds in all stages of development. Some with white feathers appearing on the abdomen; as yet they were still little fluffy balls of down above, like unto the first young one found. Then the next stage of growth was the development of white feathers on the face, in addition to those on the abdomen, with the outer wing feathers or primaries developing strongly, as also the tail feathers, whilst the down was still adherent to the back, flanks, and top of head. Then a further development again was seen in the more mature bird, whose body was not so fat and soft, the muscular tissue being more pronounced. This bird had all its feathers fairly well developed and with but slight traces of down showing in single threads through parts of its feathers. It had, I afterwards ascertained, been deserted by its parents, and left to its own devices. Such birds, after a time—roughly speaking, about a week—gradually lose all their down, while their wing feathers, especially the primaries, elongate until they are able to get enough leverage to fly. Each night the bird, which is left to starve by its parents, takes to roaming about the rookery, prompted by the pangs of hunger. It does not die, since it assimilates its heavy lining of fat, accumulated during its inactive and indolent life in the younger state in the burrow, where it is fed by its parents nightly with about two teaspoonfuls of an oily, fishy paste. The starveling, owing to its nightly meanderings around the rookery, gains confidence, and also muscular development both in the wings and legs, since many of them can be observed at night time running and flapping about in the scrub and mesembrianthemum growing about the rookery. After about a week of this life, having gradually acquired sufficient strength and experience, they undertake a nightly flight with the adult birds, who, no

doubt, carefully assist them at sea until they can safely weather any storm. The young petrels are fed by the old birds by regurgitation, in the following manner :—When the parents arrive home they open their beaks widely over the heads of their offspring, which forthwith thrusts its head into the open gape of its parent, and, opening wide its tiny bill, the contents of its parent's stomach—consisting of a fishy, oily paste—is ejected into it.

I had conjured up visions of a repetition of the scenes enacted at the home-coming of the Mutton-bird (*Puffinus tenuirostris*), a petrel which burrows in a similar manner to the "Mother Carey's Chickens," but the scene was just the antithesis to that which I expected. Whereas when the Mutton-bird arrives home it does so in vast numbers—thousands of birds can be seen filling the air at one time, just about dusk—and on reaching their burrows they burst forth into demoniacal noises, remaining at home until just before daylight, the White-faced Storm-Petrel, however, comes home long after dark, singly and silently, and, flitting for a few moments up and down the rookery on the outlook for its burrow, it descends quietly into it, and after about seven to twenty minutes it reappears and flies out to sea again.

Wet to the knees from wading through the lagoon, I lay shivering at the rookery, the cold, fierce gale chilling me to the bone, and the loose sand meanwhile being blown into my eyes. Patiently I waited from 7.30 p.m. to 8.30 p.m., when a single bird flew over me and alighted at the mouth of a burrow a few yards away, and after a few vigorous backward kicks with her webbed feet, she scratched away the loose sand that had been blown into the mouth of her nesting place, and silently disappeared into it. A faint purring sound of welcome could be heard, evidently made by the nestling in anticipation of a meal. After about ten minutes the adult bird reappeared and silently departed, flying off the ground with ease—just the opposite method to the Mutton-bird, which has to obtain windage for its wings by leaping off an eminence such as a cliff, or running rapidly down a steep sandy slope free from obstacles, before it can fly. The next adult bird to visit this part of the rookery arrived at 9.5 p.m., and then they came flying in from seawards every few minutes until 10.40 p.m., after which only a few stragglers arrived. It was indeed a weird experience as I lay, benumbed with cold, watching their movements, to observe which I had to continuously clear the sand out of my eyes. What a wild and stormy night it was, the only spark of comfort being the ray of light from the Queenscliff lighthouse in the distance.

As I was desirous of securing an adult bird for photographic purposes, I stayed at the rookery until I had secured two by blocking them in their burrows by boarding up the entrance, and so left them until the next day. At 1.35 a.m. I left the rookery and

waded across the lagoon to the hut to obtain something to eat, for which I was quite ready, having had nothing to eat since the previous noon. All attempts to light a fire, however, failed, owing to the gale scattering the embers in all directions, so I had to be content with a cold snack. Rolling myself in my blanket, I had a rest for a couple of hours, and then once more proceeded to the rookery to watch for any further developments in the habits of the birds, but, except for an occasional sight of an adult bird leaving the rookery, nothing unusual happened.

At daylight I examined the rookery on the smaller island, and found that it was about eight acres in extent, and was situated in the south-west corner. After photographing the adult White-faced Storm-Petrels in different characteristic poses, I determined to try and ascertain the extent of the rookeries, and found another in the north-east corner of the main island. This, I noticed, had almost been destroyed by guano-getters, who had carted away at least three-fourths of the rookery for manure, until, at the instance of this Club, the Government some little time ago proclaimed it a reserve. The portion of the rookery now remaining covers about two or three acres. Thus the total acreage of the rookeries is not more than ten or eleven acres at the outside. Allowing one tenanted burrow to a square yard, the number of birds nesting on Mud Island works out therefore at 48,000, which, perhaps, may be slightly over-estimated.

Walking around the island I noticed that it was very much like the coral atolls of the South Seas, with their placid interior lagoons. It is three miles in circumference, and is composed of sand, shell, and mud, which covers a conglomerate of shells and sand of the texture of limestone. The surface of the sand dunes are freely covered with Samphire, *Salicornia australis*, Currant Bush, *Styphelia richei*, Pig-face Weed, *Mesembrianthemum æquilaterale*, Native Spinach, *Tetragona expansa*, Cushion Bush, *Calocephalus brownii*, several salt-bushes, and a few stunted acacias, *Acacia longifolia*, whilst growing in the swampy parts was a long, coarse grass.

In one of the sand dunes I found portions of the skeletons of an animal which I thought at first sight might have belonged to some extinct island form, but closer examination proved them to be the remains of sheep that had been slaughtered by the guano-getters for food. Unfortunately the guano-getters have left a pest behind—a pest which if not checked may in time exterminate the Petrels. I refer to the rat, and evidences of the destructive work of either rats or Gould's Harrier, *Circus gouldi*, were observed, for portions of freshly killed Petrels were noticed in several places.

The land birds found on the island include the Domestic Sparrow, whose nest was found in nearly every acacia tree,

whilst in the eaves of the hut a Welcome Swallow, *Hirundo neoxena*, had built its mud nest. A few Land Rails, *Hypotænidia philippinensis*, were seen, and some of them, no doubt, nest in the long, coarse grass. The little Silver-eye, *Zosterops cærulescens*, was observed gobbling up the fruit of the white currant (Styphelia) bushes with avidity; whilst the White-fronted Chat, *Ephthianura albifrons*, was everywhere present, and they, no doubt, build their nests in the bushes and long grass on the island. White-fronted Herons, *Notophoyx novæ-hollandiæ*, and also the Pacific Heron, *Notophoyx pacifica*, were seen in flocks wading the shallow lagoon, ever and anon stabbing with their stiletto-like bills at the fish fry as they swam past. The Meadow Pipit or Ground-Lark, *Anthus australis*, was occasionally seen, but it is doubtful if they breed there. The mournful note of the Grass-bird, *Megalurus gramineus*, was everywhere heard—mournful, no doubt, to our ears, but the sweetest music in all the world to its mate. The introduced Starling was seen feeding along the shore, whilst high up overhead an Australian Swift could be observed cleaving through space hawking for insects. A pair of Gould's Harriers were seen hovering over the grassy part of the island, the distinctive white patch on the rump gleaming in the bright sunlight.

Out in the calm water Hoary-headed and Tippet Grebes were seen diving for their prey, and in close proximity to several Musk Ducks. The carcasses of a Black Cormorant and a Fairy Penguin were picked up on the beach, several of these birds being observed swimming in the sea, as was also the Pied Cormorant. The boatman informed me that years ago the Black Cormorant used to nest on the island in dozens until continued interference with their nests drove them away. Silver Gulls used to nest there also, and occasionally a Pied Oyster-catcher would lay its two eggs on the sand close to the water. The Little Red-capped Dottrel was observed running along the sand gobbling up the Sand-fleas, or Hoppers, a species of crustacean, whilst out on a sand-spit the Pacific Gulls were found resting.

At one time Black Swans probably nested there, for the Rev. Robert Knopwood, A.M., in his "Journal of the Proceedings of H.M. Ship *Calcutta*" (reprinted in the "Historical Records of Port Phillip," edited by J. F. Shillinglaw, 1879) has this entry:—"Tuesday, 11 (October, 1803). Wind S.S.E. A.M.—The same party and self went on shore to the island in the middle of the bay, now called Signet (!) Island, where we see a great number of Black Swans. I was the first that killd one on the island. We kill 3, and caught many alive, and caught many Pelicans, and some sea birds. . . ."

The return of the boat necessitated my leaving this interesting spot, and thence once more back to the city. The following

Saturday, 23rd February, I proceeded to the island again, accompanied by a party of bird-lovers, so that I could confirm my previous observations, and also make further notes where possible. The weather was hot and the sea calm, and we had a delightful passage down the bay in the steamer, being followed by several Richardson's Skuas, that hovered over the wake of the ship in the hopes of getting any of the garbage thrown overboard. Disembarking at Queenscliff we took a large fishing boat, and had to pull all the way to the island, there being a dead calm. We passed *en route* the Pope's Eye Fort, a solitary speck of rock commanding the South and West Channels, and useful now only as a refuge and roosting place for numbers of sea-birds.

Arriving at the island as the day was waning, after a hasty snack we set out for the rookery. But what a change there was! The lagoon between the islands was now almost dry, and many of the wading birds had departed on their great northern flight to Siberia and the East to breed, whilst the balance was scattered over the vast areas of mud flats, now uncovered. Proceeding to the rookeries, we took up our quarters in different places, intent on observing the home-coming of the White-faced Storm-Petrels. Previous to reaching the rookery instructions were given against the treading on any of the burrows, since they readily cave in when trodden upon, and the unfortunate nestling is either crushed to death or suffocated. Owing to there being very little air movement on this trip a distinct musky odour was noticeable at the petrelry. Several hours' observation confirmed my previous conclusions, and we retired to rest well satisfied with our enhanced knowledge. As the night was calm and moonlight we slept out in the open. Some of the party elected to camp under bushes so that the moonlight would not shine in their eyes, but they had cause to be sorry for this, because during the night a heavy dew was deposited on the leaves, and this continually dripped on to the faces of the slumberers below, much to their annoyance. Those who had faced the moonlight were quite unaffected, although the drops of dew covering their rugs looked like white hoar-frost when daylight appeared and caused it to glisten. During the night the harsh cry of the Spur-wing Plover grated on our ears, whilst the quacking of some Black Ducks close by told us that they were about to settle down for a rest on the quiet waters of the lagoon.

Next day a visit was again paid to the rookery and further notes taken and several photos. snapped. It was noticed that, like the Mutton-bird, the Storm-Petrel lays only one egg in a burrow, with no pretence whatever of a nest at the end. Many of the White-faced Storm-Petrels' eggs are slightly spotted at the larger end, these reddish-brown markings being found only in the incubated eggs. What lesson does this teach us? Of what

utility is it as a colour protection? Are these spotted eggs laid only by old birds? The burrows that were frequented by the young were free from excreta, which is evidently cleared away nightly by the parent birds. It was noticed that a fair proportion of the Storm-Petrels that had reached the adult stage had departed. Mr. Joseph Gabriel informs me that some years ago both the White-faced Storm-Petrels and Mutton-birds did not breed one season; they were found dying in thousands, their carcasses being washed up along the shore. This mortality was attributed to the scarcity of "whales' food," a species of crustacean found floating on the surface of the sea, and which forms the principal diet of these birds. These birds can be seen in hundreds of thousands at a time feeding upon these crustacea, and it has been recorded that a vessel steamed for many miles through a flock of Mutton-birds that thickly covered the sea for miles on either side as they fed upon "whales' food." Little Ternlets were observed hovering about with small fish in their beaks, uttering meanwhile angry cries as if we were in close proximity to their young, but search around did not reveal any of their nestlings. The island is the home of thousands of crabs, whilst the shells lining the beach would delight the eye of a conchologist, and the members of this Club visiting Mud Island came to the conclusion that it is undoubtedly a most wonderful place for the study of bird life, and yet so close to the great metropolis.

During my visits I was enabled to add twelve species to the list of birds recorded by Mr. S. P. Townsend in his paper descriptive of a trip to Mud Island, which appeared in the *Victorian Naturalist* for April, 1903 (vol. xix., p. 166), viz.:—

Silver-eye	Zosterops cœrulescens
Pectoral Rail	Hypotænidia philippinensis
House-Swallow ...	Hirundo neoxena
Australian Swift ...	Micropus pacificus
Spur-winged Plover ...	Lobivanellus lobatus
White-capped Albatross ...	Thalassogeron cautus
Gannet	Sula serrator
Black Duck	Anas superciliosa
Teal	Nettion castaneum
Tippet Grebe	Podiceps cristatus
Little Penguin	Eudyptula minor
Starling (introduced) ...	Sturnus vulgaris.

I am informed that the Delicate Owl, *Strix delicatula*, has also been seen on the island, which makes a total of 40 species of indigenous birds recorded for Mud Island.

For the following notes on the vegetation of the island I am indebted to Mr. A. G. Campbell, who made a brief visit to the

island on 27th December, 1906. He says:—"On the mud flats, above high water mark, grew *Salicornia robusta*, *S. australis*, *Sueda maritima*, and *Frankenia lævis*. *Samolus repens*, with both pink and white flowers, grew about the junction of these flats with the sand, and on the sand-banks grew *Atriplex cinereum*, *A. paludosum*, *Tetragona expansa*, *Rhagodia billardieri*, and a species of Chenopodium, in great quantity. Wherever there was root-hold in the shifting sand of the sea-front, *Cakile maritima* and *Salsola kali* were noted, and on the south-west side, which is most exposed, the rush, *Scirpus nodosus*, and the grasses, *Distichlis maritima* and *Poa billardieri*, were plentiful. At the north-west corner, where the sand has drifted into a hummock some ten feet in height, are the only attempts at larger vegetation. Here there are some fine bushes of *Styphelia richei*, *Acacia longifolia*, *Myoporum insulare*, along with *Helichrysum cinereum*, *Aster axillaris*, and *Calocephalus brownii*. The only introduced plants noticed were *Anagallis arvensis*, *Urtica urens*, and *Carduus lanceolatus*."

[The paper was illustrated by a large series of lantern slides.—Ed. *Vict. Nat.*]

NEW OR RARE AUSTRALIAN PLANTS IN THE NATIONAL HERBARIUM, MELBOURNE.

By Prof. A. J. Ewart, Ph.D., D.Sc., F.L.S., &c., Government Botanist.

(*Read before the Field Naturalists' Club of Victoria, 8th April*, 1907.)

Andropogon erianthoides, F. v. M.—Gramineæ.

Shepparton, December, 1900.

Previously recorded from New South Wales and Queensland.

Anthocercis odgersii, F. v. M., Fragm., x., p. 19.

This plant was described by Baron von Mueller from a small fragment only, and to the necessarily incomplete description the following may be added:—

This plant is a dwarf shrub of 6 inches to 2 or 3 feet in height, resembling externally some of the woolly species of Anthotroche, and of such Verbenaceæ as Newcastlia and Chloanthes. It is, in fact, the *Chloanthes drummondi* of the Elder Exploring Expedition. The leaves vary from rounded or ovate to broadly linear, do not exceed an inch in length, and are usually less. The corolla is pale yellow to brown, campanulate, with 5 equal spreading pointed lobes. The fruit is a capsule with a thin median partition, and splits into 4 valves nearly to the base. The seeds are few, 2 to 4, each 3 mm. long by 1 broad, curved and finely reticulate with longitudinal and transverse ridges.

The plant is of interest because of its extrorse unilocular anthers, unusual in Solanaceæ, and of its habit of growth, which is different to all other species of this genus. The genus, with its quadri-staminate flowers, is closely related to the Scrophulariaceæ, in which order it was formerly placed by Bentham, and this species in particular is also closely related to those woolly Verbenaceæ (Chloanthoideæ) which have four stamens and regular flowers, so that it forms a connecting link between the three orders—Verbenaceæ, Scrophulariaceæ, and Solanaceæ.

Elder Exploring Expedition, 1891, R. Helms, Victoria Desert, Camp 58, and Warangering, W.A.; Victoria Springs, Young, 1875; and Cowcowing Sand Plains, W.A., Max Koch, 1904. [Exhibited January meeting, 1907.]

Bromheadia palustris, Lindley—Orchidaceæ.

North Queensland, Mrs. Rowan, 1891.

This genus of Malayan orchids has not previously been recorded for Australia. Its presence here is not surprising, and a secondary introduction seems hardly possible in this case.

Deyeuxia (Agrostis) montana, Benth.—Gramineæ. (*Deyeuxia quadriseta*, Benth., var. *montana*.)

Specimens obtained from Mentone by Mr. Tovey, in December, 1906, while bearing a general resemblance to *D. montana*, Benth., in other respects agree with *D. quadriseta*. These species are both very variable, and run into one another at all points. The sole distinction lies in the prolongation of the axis of the spikelet in *D. montana* as a glabrous or hairy bristle, which is usually absent in *D. quadriseta*. Some specimens, however, show the bristle quite well, though otherwise agreeing with the type specimens, and very occasionally the bristle may bear a glume or imperfect flower, as in *D. montana*. There can be no doubt that *D. montana* is merely a mountain variety of *D. quadriseta*, not constantly differing in any one feature from that species, but with a strong and variable tendency towards the prolongation of the axis of the spikelet, or even to the production of a second flower. Except in this respect the descriptions of the two species in Rodway's "Tasmanian Flora" are practically interchangeable. The species therefore becomes *D. quadriseta*, var. *montana*.

Specimens of Deyeuxia exhibited at the January (1907) meeting of the F. N. Club.

Eragrostis lacunaria, F. v. M.—Gramineæ. (*Eragrostis rankingi*, Bailey, Fl. of Qld., p. 1907)

Bailey's specimen of *E. rankingi* tallies exactly with type specimens of *E. lacunaria*, F. v. M. The description of this plant as a new species can only be due to a mistake in identifica-

tion. Bailey's specimen has a less developed bulbous stem than usual, being younger, and is slightly more hairy than most specimens of *E. lacunaria*. The description of *E. lacunaria* as glabrous in Bentham's Fl. Aust. is incorrect; scattered hairs are commonly present at the bases of the erect shoots. In old specimens these are rubbed off from the outside, but can still usually be seen on the inner shoots.

The description of *E. rankingi* in Bailey's "Flora" comes within the range of *E. lacunaria*.

	Spikelets.	No. of Flowers.	Glume.
Thus *E. rankingi*	3 to 4 lines	8 to 16	About ½ line.
Thus *E. lacunaria*	3 to 6 „	10 to 24	Scarcely ¾ „

There is therefore no reason for the maintenance of *E. rankingi*, Bailey, since this species is merely a synonym for *E. lacunaria*, F. v. M.

Fimbristylis tenera, R. and S.—Gramineæ.

Rockhampton, Queensland; *legit* Amalia Dietrich.

Determined by Boeckeler.

Not recorded previously for Australia, but given in the "Index Kewensis" as from the tropical Old World.

Hedyotis (Oldenlandia) trachymenoides, F. v. M.—Rubiaceæ.

Roebuck Bay, West. Aust.; O. Tepper, 1890.

Very rare; the only specimen in the Herbarium. The original specimens are missing, being possibly still in the hands of the trustees of the late Baron von Mueller.

Newcastlia dixoni, F. v. M. and Tate.

Victoria Desert, Western Australia; Elder Exploring Expedition, 1891.

New for Western Australia. Previously recorded from South Australia, also Victoria. From the latter State we have no specimens; perhaps entered in the "Census" as from Victoria in error.

Scævola revoluta, R. Br.—Goodeniaceæ.

Powell's Creek; M. Holtze.

The specimens have more obtuse leaf tips and more spreading hairs than the type form, and the species is rare; from N. Australia.

Thryptomene ericæa, F. v. M.

A specimen in the Herbarium labelled *T. ericæa*, N.W. of Lake Albacutya, Victoria, C. French, sen., proves to be *T. ciliata*.

All the other specimens (in the Herbarium) of *T. ericæa* are from S. Australia, hence this species appears to be erroneously recorded from Victoria in the last "Census" (1889).

UNRECORDED INTRODUCED PLANTS.

By Prof. A. J. Ewart, Ph.D., D.Sc., F.L.S., &c.

(*Read before the Field Naturalists' Club of Victoria, 8th April*, 1907).

Alyssum maritimum, Lam.—Cruciferæ. Sweet Alyssum.
Warrnambool and Port Fairy, 1901, H. B. Williamson.

Cenchrus tribuloides, Linn.—Gramineæ.
This genus is represented in Queensland and New South Wales, but by different species. The present one is an introduction from North America. The grass is obnoxious, on account of the prickly burr-like fruits, this introduced species being far worse than the native Australian ones, which so far do not appear to have invaded Victoria.
From Colac, Mariner, 1895 (under name *C. echinatus*, a New South Wales species); Noradjuha, Shire of Arapiles, A. Sinclair; and Angustown (Reedy Lake), G. Cameron, 1907.

Collomia linearis, Nutt.—Polemoniaceæ. Narrow-leaved Collomia.
Romsey, Seymour, 1907.
Probably only a garden escape.

Convolvulus arvensis, L.
A troublesome weed in gardens.

Crepis fœtida, L.—Compositæ. Fetid Crepis.
Near Dookie, W. Gamble, January, 1907.
Likely to prove a troublesome weed. Fruits with pappus, spread by the wind.

Eleusine coracana, Gaertn.—Gramineæ.
Near Melbourne, C. Walter, January, 1883. *Ex herb.* Walter, under name *E. indica*; South Australia, W. J. Colebatch, March, 1907.

Lychnis dioica, Linn., var. alba (*Lychnis vespertina*, Sibth.)—Caryophylleæ. White Campion.
Snowy River, October, 1904. Sent by H. B. Williamson, February, 1907.

Medicago maculata, Willd. Spotted Medick. Generally distributed.

M. orbicularis, Allioni. Generally distributed.

M. scutellata, J. Bauh. Generally distributed.
The foregoing Medicks were probably introduced with agricultural seed; the two latter are mentioned in Mueller's "Select Plants," and are known as Snail-Clovers.

Oxalis cernua, Thunb. South African Wood-Sorrel.
From various localities; widely spread.

Pennisetum longistylum, Hochst.—Gramineæ. Long-styled Feathergrass.

Geelong and Essendon, H. B. Williamson (received 1907); Snowy River, C. Walter, 1888; Encounter Bay, South Australia, Miss Hussey, 1895.

An escape from cultivation, now becoming naturalized.

Scandix pecten-veneris, L.—Umbelliferæ. Shepherd's Needle or Venus's Comb.

A naturalized garden weed at Geelong and Hawkesdale; H. B. Williamson, 1901.

Senecio elegans, L.—Compositæ. Elegant Groundsel.

A naturalized garden escape.

Mouth of the Hopkins River, H. B. Williamson, since 1898.

S. mikanioides, Otto (*Senecio scandens*, De C., *non* Don).—Compositæ. Cape Ivy.

A naturalized garden escape at Koroit since 1900; H. B. Williamson.

This well-known garden climber from South Africa is generally cultivated in our gardens under the name of *Senecio scandens*, De C., but there being a prior *S. scandens*, Don, from India. *S. scandens*, De C., is only a synonym to *Senecio mikanioides*, Otto.

Setaria macrostachya, H. B. and K.—Gramineæ.

Native to all the States excepting Victoria and Tasmania. Introduced in Wanalta district along with sorghum. Probably on the way to become naturalized.

Trifolium angustifolium, L. Spring or Narrow-leaved Clover.

University Grounds, G. French, 1890: Avoca, December, 1900; and many other localities.

T. parviflorum, Ehrh. Small-flowered Clover.

Wimmera, 1893; Werribee Gorge, A. J. Ewart, 1906.

Veronica agrestis, Linn. — Scrophularineæ. Procumbent Veronica.

Likely to spread.

Sent in from many localities. (Geelong and Warrnambool, H. B. Williamson.)

Watsonia meriana, Mill., var. iridifolia.

A garden escape, rapidly establishing itself in the Mornington district.

"Wild Life in Australia."—An illustrated work under the above title, from the pen and camera of Mr. D. Le Souëf, C.M.Z.S, Director of the Zoological Gardens, Melbourne, is in the press, and should be a valuable help in the popularizing of Australian natural history.

The Victorian Naturalist.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 13th May, 1907.

The president, Mr. F. G. A. Barnard, occupied the chair, and over 60 members and visitors were present.

REPORTS.

A report of the excursion to Ringwood on Saturday, 13th April, was furnished by the leader, Mr. E. O. Thiele. The object of the excursion was to point out in the field how the geography of a country is influenced by physical force in the shape of water action, and the intrusion of the Mullum Mullum or Deep Creek into the valley of the Dandenong Creek was clearly demonstrated.

A brief report of the excursion to Fisherman's Bend, which was held on Saturday, 27th April, was given by the hon. sec., Mr. J. A. Kershaw, F.E.S., who, in conjunction with Mr. E. O. Thiele, acted as leader, in the absence, through illness, of Mr. T. S. Hall, M.A. About ten members attended, and the greater part of the afternoon was devoted to shore work. The usual marine forms were met with, furnishing objects both for examination and discussion. The occurrence of fossil remains in the vicinity of the rifle-butts afforded an opportunity for a search among the sand hummocks, which resulted in a few shells and small crustaceans being found. A brief explanation of the geological features of the district, given by Mr. Thiele, added considerably to the interest of the proceedings.

Mr. Thiele also submitted a report of the excursion to Coburg on Saturday, 11th May, during which he again acted as leader in the unavoidable absence of Mr. J. A. Leach, M.Sc. Eleven members attended, and the afternoon was spent in examining the relation of the basalt to the underlying Silurian rocks, and the resulting infiltration of some of the chemical constituents.

A report of the junior excursion to East Coburg on Saturday, 4th May, was furnished by the leader, Mr. R. W. Armitage, who dealt very fully with the various results of water action to be traced in that neighbourhood.

ELECTIONS.

On a ballot being taken, Mr. John Harrison, State school, Horton, was elected a country member, and Mr. David Seaton, Continuation School, Melbourne, an associate.

GENERAL BUSINESS.

The question as to whether the Black Swan should be further protected by extending the close season for the whole year was again brought forward for consideration. The hon. sec., Mr. J. A. Kershaw, stated that he had made inquiries among a number of persons keenly interested in the question as to whether there was any noticeable diminution in the number of birds under the protection at present afforded by the game laws, and also as to whether it was considered necessary to extend the close season. He found that the general opinion was that, except perhaps in some inland districts, there was no noticeable decrease in the number of the birds, and that the protection at present afforded—viz., from 1st August to the 31st January—was considered sufficient. He was of opinion, however, that as it was well known that the eggs were to be found right up to the end of January, the season should be extended for two months longer—viz., to 1st April. He moved a resolution to that effect, which was seconded by Mr. G. A. Keartland, who stated that, on account of such a typically Australian bird as the Black Swan, it was desirable that some further protection should be afforded them. Mr. G. Coghill moved, as an amendment—"That the Black Swan be protected during the whole year." This was seconded by Mr. A. D. Hardy, F.L.S. After some further discussion, during which several other members spoke, the amendment was put to the meeting and declared carried.

A communication was read from the Inspector of Fisheries, Melbourne, stating that a suggestion had been received that the close season for the Opossums might, with advantage, be altered from the present date (viz., 1st June to 31st December) to that of the 1st March to 31st October in each year, and requesting the opinion of the Club on the matter. The question was discussed by several members. Mr. J. A. Kershaw, F.E.S., urged that it was known that these interesting and perfectly harmless animals, which embraced the Flying as well as the Common and Ring-tailed Phalangers, were being rapidly exterminated, they should be protected for the whole year. Mr. G. A. Keartland stated that the breeding season extended from May to July. Mr. A. D. Hardy stated that the Opossum was known to attack both fruit and vegetables. It was finally decided to postpone the question for further consideration.

NOMINATIONS FOR OFFICE-BEARERS.

Nominations for office-bearers for 1907–8 were received, and Messrs. D. Best and J. Shephard were elected to audit the accounts for the past year.

PAPERS.

1. By Mr. E. Jacobson, entitled "Notes on Web-spinning Ants," communicated by Mr. F. G. A. Barnard.

The author enumerated the various references to web-spinning ants, and related his own observations on the Javan species, *Œcophylla smaragdina*, Fabr.

2. By Professor A. J. Ewart, D.Sc., Ph.D., entitled "The Negative Phototaxis of Blow-fly Larvæ."

The author in an interesting way related his observations on the efforts of the larvæ of the Blow-fly to get under cover when disturbed, and expressed the opinion that it was due to their inherent objection to light.

3. By Professor A. J. Ewart, D.Sc., Ph.D., entitled "Contributions to the Flora of Australia, No. 3."

The author submitted a series of critical remarks on certain specimens in the National Herbarium, Melbourne, which, being of a technical nature, was taken as read.

4. By Mr. Isaac Batey, entitled "Native Animals of the Sunbury District Sixty Years Ago," communicated by Mr. A. G. Campbell.

Owing to the lateness of the hour this paper had to be postponed.

NATURAL HISTORY NOTES.

Mr. F. Pitcher made some observations on his exhibit of specimens of the plant *Elodea canadensis*, Michaux, which was found growing in the Japanese garden lake in the Treasury Gardens, Melbourne.

Professor Ewart also gave some particulars regarding this plant, which he condemned as a pest.

Mr. G. A. Keartland reported an instance of a Blue-tongued Lizard, *Tiliqua scincoides*, devouring its young while in confinement.

Mr. A. G. Campbell read a note on the occurrence of *Candollea sobolifera* and *Eucalyptus alpina* at Mt. William, Grampians.

EXHIBITS.

By Mrs. and Miss Bage.—The following specimens from the Hot Lake district, New Zealand :—Sulphur—yellow, black, and crystals ; raddle (red ochre), used by the Maoris for painting their houses ; pumice, and partially petrified wood ; also cinders from the Tarawera eruption of 1886.

By Mr. F. G. A. Barnard.—Specimen of fish, Lepidotrigla, sp., one of the gurnards, caught at St. Kilda Pier, 4th May, 1907.

By Mr. A. G. Campbell.—Three eucalypts from Mt. Redman, Grampians (2,500 feet).

By Mr. C. French, jun.—Large aboriginal stone axe from Stacey's Bridge, Gippsland, and aboriginal stone axe from Branxholme, Victoria.

By Mr. A. Mattingley.—Specimen of Marbled Gecko, *Phyllodactylus marmoratus*, with five tails.

By Mr. F. Pitcher.—Fresh and dried specimens of *Elodea canadensis*, Michaux (syn. *Anacharis alsinastrum*, Babington), North America, found growing in the Japanese garden lake in Treasury Gardens, Melbourne.

By Mr. J. Stickland.—Sap movements in *Elodea canadensis*, under the microscope.

After the usual conversazione the meeting terminated.

EXCURSION TO RINGWOOD.

THE geographical excursion to Ringwood, on Saturday, 13th April, attracted about seventeen members. The chief object of the trip was to study a case of stream re-adjustment or capture shown by the upper course of the Mullum Mullum or Deep Creek. This feature was described in the *Victorian Naturalist*, vol. xxiii. (1906), p. 101, so that it is only necessary to briefly indicate the route taken by the members to examine the present stream system and consider the past arrangement. A beautiful clear afternoon provided a splendid series of views of the distant mountains and the intervening country. The Warrandyte road was followed for about three-quarters of a mile across the wide open valley of the upper Mullum Mullum. A turn to the left was then made to follow a branch road skirting the side of Pinemont Hill. This prominent elevation, which rises to about 600 feet above sea-level, was ascended. An extensive panorama in all directions was much enjoyed, and the conditions of the position were favourable for the observation and discussion of the Mullum Mullum stream "piracy," whereby part of the drainage area of the Dandenong Creek basin has been added to that of the Yarra. Steps were next turned westwards towards Mitcham, and the descent to the Mullum Mullum on the way enabled the party to note the change in the character of the valley to a more gorge-like character, where the old water parting has been cut through. While returning through the paddocks towards Mitcham, the little orchid, *Eriochilus autumnalis*, was found in bloom; also the eucalypt, *E. stuartiana*, which formed a very handsome object. A few spikes of *Epacris impressa* were also picked, and the fern *Lindsaya linearis* was noted.—E. O. THIELE.

EXCURSION TO COBURG.

ABOUT eleven members met on Saturday, 11th May, and proceeded to study the geological features of the Merri Creek, near Coburg. As it was stated that rifle matches were being held on the eastern side of the Pentridge Stockade, the causeway and columnar basalt in that vicinity could not be visited. Observations were, there-

fore, directed to sections along the creek, some little distance above the rifle-butts. Here quite enough was found to occupy the attention of the members for the short afternoon. Various characteristic structures in the basalt were noted. The mouth of a small tunnel in a steep bank of the stream showed the scoriaceous base of the lava flow, resting on a somewhat baked surface of gravelly clay. A fine section, about 200 yards to the north of the northern wall of the Stockade, showed the basalt resting on the sloping surface of the sedimentary rocks. A thin layer of gravelly clay here separates the lava flow from the underlying Silurian rocks. Typical features in the weathering of the basalt attracted attention, and among other features noted was the infiltration of carbonates of lime and magnesia from the overlying basalt for some distance into the joint and bedding planes of the underlying Silurian rocks. The shortness of the afternoon did not allow the party to visit the instructive example of hillside runnel erosion to the east of Pentridge.—E. O. Thiele.

EXCURSION TO EAST COBURG.

About a dozen junior members attended the excursion to East Coburg on Saturday afternoon, 4th May, arranged for the purpose of studying water-action. Owing to rain having fallen freely a couple of days before the excursion, the small streams studied had laid down beautifully assorted series of sediments, which we were fortunate in being enabled to see while they were yet fresh. One result of the action of running water on the surface of the land, we were able to observe, was how basaltic lava, which once must have flowed down a valley with high land on either side, exists now as a ridge with valleys on either side. The high sides of the original valley, owing to being composed of more easily removed material than the harder basalt of the valley, have disappeared by water-transportation, and in their places river-beds at a much lower level than the basalt now exist. The action of water in carrying away from a lava plain some of the weathered and decomposed lava, leaving the harder parts outstanding as basaltic boulders on a boulder-strewn surface, was also studied.

In the tertiary deposits to the west of the Coburg Cemetery we saw on a small scale a beautifully dissected plateau, with its water-partings, river valleys, residual ridges, and buttes. Attention was drawn to the fact that all our Victorian mountain ranges have been formed by denudation by the same agent as dissected this piece of plateau. We saw here how rivers may destroy lakes by filling them with transported material. It was pointed out that the Rhone River is gradually but surely filling up the beautiful Lake Geneva. No sooner is a lake formed

than rivers begin to destroy it. Ideal delta-fans were noticed, and the mode of their formation studied. It was seen how rivers flowing over such formations are forced by their own energetic work to continually find new channels, owing to the rapid deposition of sediments filling up the earlier-made channels. It was clearly seen how a number of delta-fans could coalesce, and plains—such as the Canterbury Plains of New Zealand—be formed. It could easily be seen why it would be useless work to bridge such rivers, and why many of the rivers of the South Island of New Zealand are left unbridged.

To the north of the cemetery the marvellous effects produced by running water during the last fifteen years in the soft tertiary sands and clays were observed. The amount of water that has produced this earth-sculpturing must have been comparatively small, for its "gathering ground" covers only a few hundred square yards. Yet here we see the whole countryside carved out into canyons with fantastically wrought sides, subterranean channels, natural bridges, residual mountain ranges, mesas, subsided areas, &c., giving the spectator a perfect replica on a small scale of the "bad lands" of Dakota and North-Western Canada. In one place the water had carried down such a load of sand that it had barred up another stream into which it had flowed and had formed a lake. Thus we were able to notice one way whereby rivers may make a lake, which they would subsequently fill. Attention was drawn to the mode of formation of the surface crust of the land. This crust, which in some places was a couple of feet thick, is due to a cementing, caused mainly by the lime and iron salts being left in the surface of the plain after water in which they are dissolved has ascended from below and then evaporated. It was owing to the breaking of this surface crust by the ploughing of drains that the running water was able to corrode the softer rock below, with the surprising effects we noticed. The manner in which a river deepens and widens its valley, and in places forms alluvial flats, tends eventually to give it an even, gentle grade throughout its whole course from source to mouth. This was well seen. The material the river uses for eroding its bed and banks was examined, as were also the manner and place of deposition of this material. Small sections cut showed this material laid down in such a way that it gave very good ideas of the meaning of "current-bedding."

The young folk with me seemed genuinely interested in the afternoon's observations, and tackled the problems suggested to them by what they saw in an eager, open-minded fashion; and in conclusion I must state that we formed a happy little party, and all spent a pleasant and profitable afternoon together.—R. W. Armitage.

PLATE I.

WELLINGTON KNOB.

No. 1.

GLIMPSE OF TALI KARNG FROM ECHO POINT ON RIGGALL'S SPUR

(Part of Barrier in foreground).

No. 2.

WELLINGTON VALLEY FROM MONUMENT GAP (SERPENTINE AREA)

(Looking west to "The Crinoline").

PHYSIOGRAPHICAL AND GEOLOGICAL NOTES ON THE MT. WELLINGTON DISTRICT, NORTH GIPPSLAND.

By E. O. Thiele.

With an Appendix on Some Fossils, by F. Chapman, A.L.S.

(*Read before the Field Naturalists' Club of Victoria, 8th April*, 1907.)

In January of the present year a third excursion was made to North Gippsland to further examine the geographical and geological features of the district round Mt. Wellington. The previous trips had suggested a number of problems which required more evidence before an answer to the various questions could be attempted. A fertile field for inquiry had been opened up. The most time, however, which could be again spared for explorations in this district was three weeks, and the roughness of the country, together with the time taken up in travelling to get into the heart of the region, could only allow of the work being somewhat incompletely accomplished.

The brief enumeration of the more salient points which called for attention will serve to summarize some of the previous knowledge, and indicate the plan and object of the last excursion.

1. The extent and further examination of the Upper Ordovician graptolite slates of the Wellington area was worthy of additional attention (8).

2. The relation of the serpentine belt to the Ordovician slates and Upper Palæozoic rocks needed working out, for sections showing this had yet to be searched for. Other promising features in the serpentine area also required examination (9).

3. The great development and variety of the porphyritic rocks of Mt. Wellington and its vicinity called for special investigation (3, 1). The preliminary examination of several rock slides from this area confirmed their volcanic origin, and suggested their correlation with similar rocks in known sections elsewhere.

The great mass and general contour of the mountain at first sight suggested that an ancient volcanic stump might prove to be the explanation of the great pile of igneous rocks, but as there was little evidence in hand for this at present, that view could only be regarded as a suggestion, requiring further investigation.

4. A more careful examination of the rocks of the barrier in the "Valley of Destruction," below Tali Karng (6, 10), should enable a more accurate comparison to be made with those of the table-land and the surrounding ranges. This, it was hoped, would provide additional evidence, if that were necessary, as to the source of the rocks which impounded the waters of the lake.

5. The old strike valleys on the dissected plateaus offered some interesting objects of study, for here incipient or recent lines of drainage alterations, affecting the remnant of a more

ancient system, appeared to present a productive field for inquiry.

6. The relation of the present valleys to the prevailing rock structure, faults, joints, &c., together with the study of these and other factors which have combined to give expression to the present scenic features, formed an attractive problem, but probably too complicated to generalize on until more detailed knowledge had been gained.

7. The possibility of finding new and interesting geological occurrences in such a district is always an incentive to penetrate into the untrodden paths, and to all lovers of nature and mountain scenery this district offers considerable reward to the extra labours at times called forth by its rugged and toilsome slopes.

No attempt can be made at present to discuss thoroughly all the questions which have been referred to above. Many of the rocks will have to be examined microscopically and chemically before an answer to some can be hoped for.

A brief itinerary will serve to indicate the ground traversed, and show the range of the observation. The party numbered four :—Messrs. A. O. Thiele, V. R. M'Nab, G. Ampt, and myself. Horses were again procured from Mr. W. Reid, of Glenmaggie, who also accompanied us as far as our first base, on the Wellington River, at the Dolodrook junction. No riding horses were retained, but two pack-horses were kept for shifting camp from time to time. Arrangements were made for Reid to meet us here again with additional horses for the return in two weeks' time.

About a week's supply of provisions was left at the camp, and a move was made to the top of Wellington, where another base was established. From here an unexplored spur was traced down to the Moroka, at a spot convenient to follow this stream down sufficiently far to enable Snowy Bluff to be examined. This section had been so carefully examined by Dr. A. W. Howitt and Mr. R. Murray (1 and 2) that it was suggested that a comparison of the rocks of the area with those of Wellington would be profitable.

The descent to the Moroka was the most direct route by the spur chosen, but it proved the most difficult and trying experience of the trip.

Snowy Bluff, however, was successfully reached, and is well worthy of the prominence which Howitt and Murray have given to it in their report, for it forms the key to much of the geology of the district. This particular section, however, is better approached by entrance to the Moroka valley from the Wonnangatta than from Wellington. A more circuitous return route to Wellington was chosen, partly as it afforded an easier ascent out of the precipitous Moroka valley and also because it gave an op-

portunity for examining fresh country. The Tamboritha mining track was therefore followed from where it ascends from the Moroka to the west. This gave an easy ascent to the divide, 4,800 to 5,000 ft. in height. The track had now to be left to trace the watershed southwards to reach the Wellington camp. No track could be found here for the first part of the distance, and the Snow Gum forest formed some hindrance to travelling.

On returning to Wellington a short stay was made to further examine its table-land and study its rocks.

Descending again to the Wellington River, some time was then available to again visit the lake and examine the Ordovician and serpentine area. By the end of this time both shoe-leather and provisions began to cause some anxiety, but by careful arrangements both were made to hold out fairly well. The necessity of light loads in such country requires often that some risk must be taken by omitting from the outfit some articles of both clothing and food which most bushmen would willingly have if possible.

A brief review of some of the questions raised in the introduction can now be undertaken as a result of additional observations collected during the trip.

Lower Palæozoic Area.—The position of the area has been previously referred to (8, 9), and good sections can be noted along the Dolodrook River, Upper Wellington and Barrier Creeks. The boundaries and exact area of this occurrence have not yet been definitely determined. The western contact with the Upper Palæozoic bed is visible on both sides of the Wellington, about a mile below the Dolodrook junction. A distinct unconformity is here to be noted, and evidence of faulting at probably distinct periods appears to be shown. These Lower Palæozoic beds can be traced continuously eastwards along the valleys up to the base of Mt. Wellington, a distance of nearly eight miles in a straight line. Northwards along the main Wellington branch the extreme extension has not been traced, but the rocks of this series were noted for at least four miles above the Barrier Creek junction. To the south they were traced at least three miles in a direct line from the above-named junction, and, from evidence of the stream boulders they must extend much further in this direction. From very rough calculation there must be at least between 30 and 40 square miles of these rocks exposed. They can be traced up the sides of the valleys for a considerable height. On the Wellington spur leading up to the mountain they were noted up to an elevation of about 3,500 feet above sea level, or 1,740 feet above the bed of the Wellington. No fossils were obtained on this spur, but the characteristic graptolites of the area were obtained at an elevation of 1,150 feet above the river bed, several miles to the

south-east of the Dolodrook junction. The rocks of special interest in this area can be conveniently divided for the present into the following groups :—

1. Serpentine belt—Monument Gap and Dolodrook River.

2. Black indurated slates of jasperoid character, with numerous quartz veins—Dolodrook River, above Black Soil Gully.

3. Black graptolite slates, Upper Ordovician — Wellington-Dolodrook junction, &c.

4. Bluish-grey crystalline limestone, Upper Silurian—Dolodrook valley.

5. Yellowish-brown sandstones and mudstones of Wellington spur.

This separation is only made for convenience, and it is not intended to convey the impression that all these divisions indicate as many different chronological horizons. The only thing that can be stated definitely just now is that two distinct periods are represented—the Upper Ordovician and the Upper Silurian (Yeringian). The introduction of this second division is rendered necessary by the occurence of the limestone resting as isolated patches on the black slates. Fossils were recognized in a small specimen of limestone shown to me by Mr. J. Macfarlane, who went to some trouble to show us where this material occurred. Several small occurrences were noted about half a mile south of the Dolodrook River, from where the chromite occurs in the serpentine. The limestone rests apparently on and is surrounded by the graptolite slates. Mr. F. Chapman, A.L.S., has kindly examined the fossils of the limestone, and his notes on these are appended.

Further notes on the rocks of the Lower Palæozoic region are postponed for the present, pending the microscopic examination of some of the rocks.

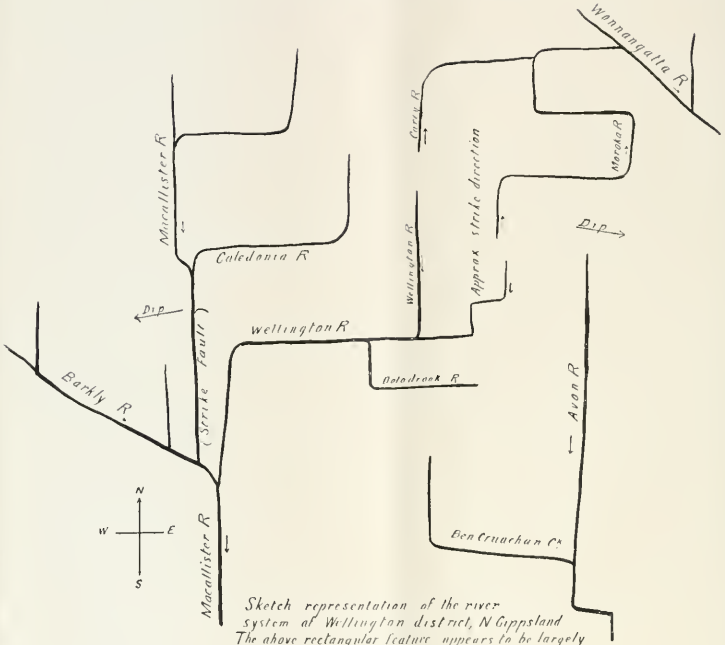
Some preliminary features in connection with the occurrence of the igneous rocks of the Upper Palæozoic series can now be dealt with. In some respects these rocks form some of the most interesting ones of the district. Their great extent and thickness cause them to have a dominating influence over much of the scenery of the Wellington and Moroka region ; their striking banded or flow structure ; their variety in hardness, colour, and texture ; their striking columnar structure in some sections, and their interbedded relation to the sedimentary rocks all combine to make them an interesting series. These rocks can be broadly divided in the field into two readily distinguished groups :—

1. Acid lavas, consisting of many varieties of porphyritic and felsitic rocks.

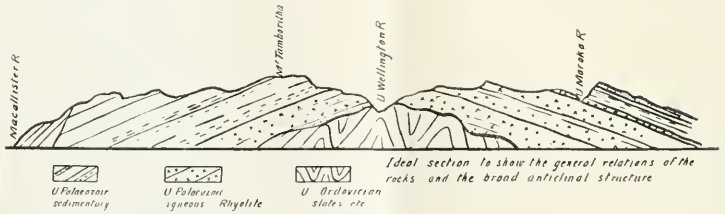
2. Basic lavas (melaphyres of Howitt).

The first class is by far the most important. They comprise those rocks referred to by Howitt and Murray as porphyries,

PLATE 2.



Sketch representation of the river system of Wellington district, N Gippsland. The above rectangular feature appears to be largely due to the geological structure.



Ideal section to show the general relations of the rocks and the broad anticlinal structure.

porphyritic felsites, banded felstones, massive felstones, &c. These rocks were all classed as acid lavas by the two geologists just named. The term rhyolite does not appear to have yet been applied to them, but both from field and microscopic examination the characters implied by this term are most admirably fulfilled by the greater part of the series. It is hoped later to give the result of a more detailed petrological examination of these rocks. In further referring to these rocks the term rhyolite will be used, as it appears more definite and accurate than the older and often loosely applied terms. These rhyolites can be traced from the extreme southern limit of the Upper Palæozoic series, a few miles to the east of Glenmaggie, continuously along the strike in a northerly direction for over 40 miles in a straight line past the Snowy Bluff. Very probably a much greater northern extension will be noted when the country between Mt. Howitt and the Snowy Bluff is examined. The greatest observed thickness of these volcanic rocks is on the western face of Mt. Wellington, where upwards of 2,000 feet is exposed. The first appearance of this pile of igneous rock from the western side, with, in part, its massive and somewhat course-grained porphyritic rocks, suggested that a volcanic stump might be represented here. Such a view might be read from the diagrammatic section given in the paper dealing with Lake Karng (10). Wider examination, however, of the surrounding country shows that much of the porphyry represents rhyolitic lavas, forming one series with the overlying sediments. On the top of Mt. Wellington, near the western edge of the main southern mass, a small occurrence of rock somewhat resembling an agglomerate was noted. The question, however, must be left as an open one, but it seems very probable that both features may be represented by the main southern mass of the mountain.

A diagrammatic sketch, approximately east and west across the country, and some miles to the north of the main Wellington mass, probably indicates the broad structural features of the area.

On the southern shore of the lake, towards the east end, and a few feet above the water line, a very small exposure of sedimentary rock was visible beneath the porphyry, and showing little or no signs of contact alteration. It appears likely, therefore, that the overlying lavas are here resting on a Lower Palæozoic platform at about the level of the lake. Towards the top of the mountain the dip of several successive lava sheets to the east can be clearly seen, and their columnar jointing forms a noticeable feature on the north-western cliffs of the mountain. On the tableland of the main southern portion the rhyolites show a striking flow structure. The prevailing colour of the rock is a light grey on the weathered surface, but in places extremely fresh faces are exposed, showing a dark to black almost glassy texture, with conspicuous white to grey lines of flow.

In the Moroka valley, not far from its head waters, and near to the spot where it makes its great easterly bend across the northern extremity of the Wellington Range, below the Trig. Station, a fine dip face of the rhyolite is exposed, passing under a thick bed of conglomerate. A tributary stream of the Moroka comes down over the rhyolite rock face and forms an attractive cascade at this spot. Other sections, as at Snowy Bluff, show the rhyolite resting conformably on conglomerate. Many features point to the fact that these lavas were, in part at least, sub-aqueous. Shallow water conditions appear to have largely prevailed, for numerous examples of current bedding and contemporaneous erosion are to be seen in the sedimentary beds. Many of the conglomerates contain both angular and waterworn fragments of the Upper Palæozoic series. In some of the upper bands pieces of rhyolite are of fairly frequent occurrence. This was noted at several places, notably on the Wellington snow plain, near the head waters of Nigothoruk Creek. Again, on the Wellington River, about a mile below the Dolodrook junction, a striking breccio-conglomerate abuts on the contorted and crushed Ordovician slates. The Upper Palæozoic beds here contain abundant fragments of black slate, quartzite, and both angular and rounded pieces of rhyolite up to eighteen inches in length. These fragmental beds, though apparently at the base here of the Upper Palæozoic, are inclined at an angle of 40° to 50° to S.W., and are evidently faulted against the Ordovician slates, so that their exact position in the Upper Palæozoic series is not clear.

In the Moroka valley some sections, in several of the spurs leading up to Snowy Bluff, show some fine examples of columnar structure in the rhyolite. One good example is shown on the right bank of the river at the extremity of a spur at a point on the mining track just below where it crosses from its descent on the western side of the river.

From a spur lower down the river, on the same side, some sheer cliffs several hundreds of feet in height, showing again fine columnar development, can be seen. The rock face overlooks a tributary valley draining from Snowy Bluff, and is difficult to approach.

High up the Tamboritha mining track, to the west of the Moroka Valley, numerous quartz geodes were strewn along either side of the route. They evidently occur plentifully in a special type of the rhyolite. Their radiating tongues of pink to white chalcedonic quartz gave them an attractive star-shaped outline. The whole of the top of the ridge traversed from the mining track, south to Wellington, appears to be composed of rhyolite. In places, especially near the top of the mining track, west of the geode occurrence, a great development of white quartz is to be noted. It appears to be a variety intermediate between

chalcedonic and ordinary milky quartz. Its occurrence suggests an extensive silicification and replacement of the original rock. It perhaps represents a hydrothermal phase of the acid volcanic activity represented by the rhyolites.

At Observation Point, a rocky outlook, 5,000 feet in height, on the ridge under consideration, and about five or six miles south of the Tamboritha track, a great panorama is obtained. Some interesting structural features can be reviewed here in the light of previous observations, and in conjunction with many suggestive features which can be recognized from this point.

It is clear that the broad general structure of the extensive belt of Upper Palæozoic rocks stretching north between the Avon and the Macallister valleys from the plains, and extending well up towards the divide, is that of a denuded anticlinal fold of considerable width. The axis of this great anticline extends in a northerly direction along a line somewhat to the west of Ben Cruachan, and through a point about midway between Tamboritha and Wellington, continuing on for an undetermined distance to the north, but visibly indicated by the opposing scarps well beyond a point to the west of Snowy Bluff. The crown of this anticline has been greatly denuded, most particularly along the southern portion, where a long tongue of Lower Palæozoic rocks has been exposed, probably stretching continuously north from the Macallister River, near Glenmaggie, well into the Upper Wellington valley, a distance in a straight line of about 30 miles. Observation Point lies on a ridge between the head waters of the Upper Wellington and the Moroka, and almost due east of Tamboritha. Here much less denudation has affected the axial line, and the rhyolites outcrop almost continuously, forming a belt of elevated broken country lower than the great table-land of Tamboritha to the west, but rising at Observation Point to 5,000 feet above sea level. Here, at a point where such features would be expected, the rhyolites show indication of anticlinal folding. On either hand the opposing scarps of the mountain ridges show clearly the features of a denuded anticline. Further evidence of the continuity of the fold was obtained by supplementing the evidence shown in Murray's sketch map of the southern portion of this area. The eastern limb of the anticline can be traced continuously south along successive scarps with an easterly to south-easterly dip slope, from Snowy Bluff through Wellington and Mt. Hump along the Avon watershed to the plains. The western limb is well developed along the Macallister River, and has been examined well up the valley, past the Caledonia junction. Ample evidence of extensive north and south faulting is also to be found along this line. The western limb along its southern portion appears to have suffered denudation more severely than the eastern. It is consequently much shorter, and is not met

with in the Macallister valley, above Glenmaggie, till Hickey's Creek is reached.

The result of this broad anticlinal structure on the rock exposures is well seen by reference to the outcrops of the igneous rocks. Two well-defined parallel bands of these rocks can be traced almost continuously along the face of the opposing scarps for a great distance. They form parts of the same lava sheets which are interbedded with the sedimentary series, were folded with them, and have since been separated into these two distinct lines of outcrop by denudation. Both belts of these rocks, as indicated on Murray's map, can be extended considerably to the north. And at Observation Point they appear to widen and unite on the crown of the less dissected part of the fold. The igneous rocks of the series appear to be invariably found at or near the base of the series. This has been shown in numerous sections given by Murray, and is confirmed by the examination of many additional sections by the writer. In places they rest directly on the upturned edge of the Lower Palæozoic, while at others intervening sedimentary beds, chiefly coarse conglomerates, are found. The greatest observed thickness of these rhyolitic lavas is to be found along the eastern side of the anticlinal axis at Wellington, where, as previously noted, it rises to about 2,000 feet. The western counterpart of the Wellington rocks is probably to be found in a section to the south-west of the Dolodrook junction. Here the range of thickness is under 1,000 feet, and intervening thin sedimentary beds lessen the actual thickness of the lava flows to some extent. Some of these rocks are hard, durable, and attractive, and would certainly be valued as ornamental building stones if they were in a more accessible position. The soil and vegetation on these areas is generally superior to that of the sedimentary rocks, but is still only of fair quality. Many of the steeper spurs, however, where the rocks outcrop, are extremely rough and rugged, and yet there are very few places where one cannot find evidence of cattle, which have sought out the occasional grassy slopes between the rugged knolls. The question of the correlation of the Wellington volcanic rocks with those of the Snowy River series calls for consideration. The age of the latter has been fixed as Lower Devonian, but the age of the Wellington series appears to represent a slightly later phase of this great volcanic activity. The greatest development of the volcanic rocks is at the base of the Wellington series, but it does not appear possible to separate them from the overlying sedimentary rocks. No break can be noted, and these rocks appear to make one continuous group. The scraps of fossil evidence obtained here and there would indicate that the uppermost beds of the series all represent the Avon series, and are therefore Lower Carboniferous.

If, then, the volcanic rocks represent a late stage in the great volcanic outburst of Devonian times, it would appear that no stratigraphical break exists here between the Devonian and Carboniferous. It is therefore difficult to say where the one stops and the other begins. Since it is at present impossible to definitely correlate these Wellington lavas with those of the Snowy River, it is suggested that they might be included under the term Wellington rhyolites, while the term Avon series can be well extended to include the overlying sedimentary beds of the whole of the region.

Ancient Plateau Valleys.—The plateau character of much of our Australian geography has been referred to by many writers. Dr. A. W. Howitt, in particular, has described the feature which is shown so strikingly in eastern Victoria. In south-eastern Australia broad earth movements of both uplift and subsidence have succeeded from time to time, with intervening periods of comparative stability. These successive movements have thus intermittently affected the river system ; the uplifts mostly in the direction of rejuvenating the streams. Various stages, therefore, in the dissection of the plains and plateaus are well shown in Gippsland. The broad alluvial plains, with their terraced banks ; the dissected Cainozoic coastal plains ; the canyon-like courses of the mountain streams, and the plateau remnants forming the snow plains of our highest mountains, form a striking series, illustrating the evolution of the present contour.

In some cases the nature and structure of the rocks have been more favourable for the longer preservation of the plateau or pene-plain character. This is particularly the case in the area comprising the slightly inclined and durable strata of the Upper Palæozoic rocks, and also the basalt-capped elevated areas, as in the Dargo High Plains. In the case of the latter, remnants of the old river-beds are found high above the present rivers and buried beneath the basalt flows. In other areas remnants of old river channels are to be found on the snow-plain country at the source of many of the streams, and not yet reduced to the grade of the present channels. Such instances are well shown in the Wellington district. They are remains of old high-level strike valleys which lie between well-marked scarps, and continue in some cases as wide, open, well-grassed valleys for some miles, and then drain out over a steep, rocky course into deep canyon-like gorges.

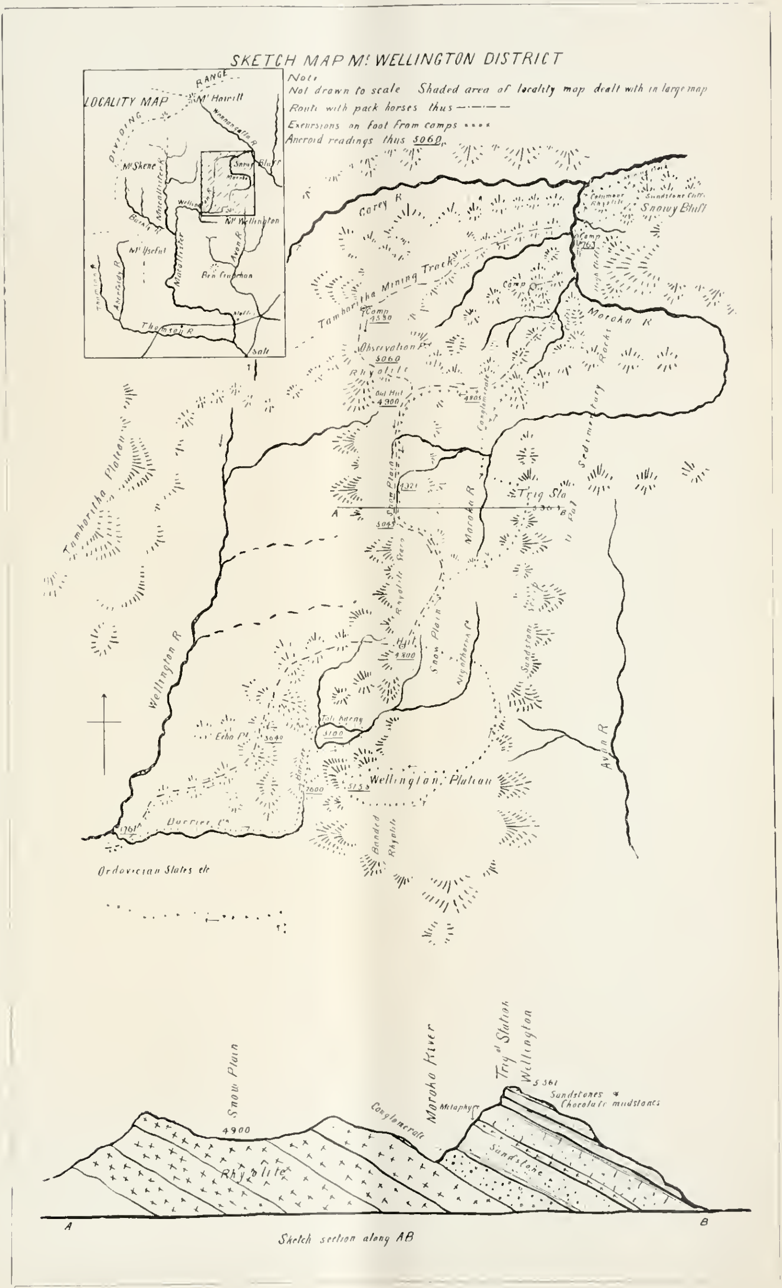
The influence of the geological structure of this area on the evolution of its river system is well shown. The broad anticlinal folding of this Upper Palæozoic belt has produced a zone of slightly inclined beds of varying hardness, consisting of hard beds of conglomerate, sandstone, or rhyolite, with softer bands of mudstone and shale.

Reference to the diagrammatic section will illustrate the fairly simple structure of some of the primitive valleys of this area. The northern portion of the Wellington Range affords a good example of this type. To the south of the Trig. Station there is a wide, open valley of well-grassed snow-plain country, situated at an elevation of nearly 5,000 feet above sea level. It falls somewhat gently southwards for between two and three miles, following the strike of the rocks. It then turns sharply to the west through a gap worn in the western scarps of the Wellington Range. This is the Nigothoruk Creek, which drains the snow country into Lake Karng. The western edge of the valley is bounded by the ridge formed by the upturned edge of a thick bed of porphyritic rhyolite, while the eastern consists of a parallel scarp of sandstones, mudstones, and conglomerate about a mile to the east. The present stream bed has cut a deep V-shaped valley along the eastern side of the broad, rounded valley. It follows fairly closely the contact of the igneous sedimentary rock, though occasionally the conglomerate lies to the west. This course is held till the sharp turn is made across the strike of the rocks.

Another similar feature, but on a somewhat larger scale, is found at the head waters of the Moroka. Immediately to the west of the Trig. Station lies the deeply incised source of the Moroka. Here it is also a strike valley for some distance, with the sedimentaries on the east forming the scarp, and the rhyolite on the west forming a dip slope. The valley continues as such for perhaps two or three miles northerly, and then turns sharply to the east, and subsequently follows a great S-shaped canyon course, with, at first sight, no apparent connection with the structure of the rocks. Parallel with the upper strike course there is a wide high-level snow-plain valley, conforming to the strike, and only separated from the deep Moroka valley by a low ridge. This has been cut through in two places by the headward erosion of the Moroka tributaries, by which the old high valleys is now drained over its eastern rim into the Moroka. The general elevation of the plateau valley varies from a little over to a little under 5,000 feet. The western scarp has also been broken towards the northern end by a stream which drains into the Wellington. The whole of this valley is broad and open, with a rounded outline and a well-grassed surface. It is well watered by small streams rising from numerous springs, and forms a most pleasing contrast to the rugged and difficult country which surrounds it. The richer grass of the valley is in some measure due to the presence of basaltic rock (melaphyre) along part of its floor.

None of these strike valleys are of great extent; they appear to be but the remnant of old valleys which have been very much cut into by the advanced plateau dissection. Their open

PLATE 3.


SKETCH MAP Mt. WELLINGTON DISTRICT
Note
Not drawn to scale Shaded area of locality map dealt with in large map
Route with pack horses thus
Excursions on foot from camps
Aneroid readings thus 5060
LOCALITY MAP
DIVIDING RANGE
Mt. Hotham
Mt. Skene
Mt. Wellington
Mt. Useful
Ben Cruachan
Thomson R.
Avon R.
Snowy Bluff
Carey R.
Tamboritha Mining Track
Observation Pt.
5060
Rhyolite
Old Hut
4900
Macalister R.
Moroka R.
Trig Sta.
Conglomerate
Sedimentary
Tamboritha Plateau
Wellington R.
Snow Plain
Nigothoruk Cr.
Sandstone
Hut
4800
Echo Pt.
Wellington Plateau
Banded Rhyolite
Ordovician Slates etc
Avon R.
Snow Plain
4900
Rhyolite
Conglomerate
Moroka River
Melaphyre
Trig Station Wellington
5 361
Sandstones & Chocolate mudstones
Sandstone
A
B
Sketch section along AB

character, rounded outline, and gentle slopes contrast them strongly with the deep rocky gorges of the main streams of the district. The continuity of the old strike valleys along or near the anticlinal axis appears to have been much broken by the headward advance, from both sides, of tributaries from the deep valleys of the Macallister on the west and the Avon and Wonnangatta on the east.

If for simplicity the prevailing direction of the main streams of this area be indicated by straight lines, a series of more or less rectangular blocks of varying size is noticeable. This results from sharp change of direction of many streams from a strike direction to one at right angles. In reality the corners and edges of these rectangles have been much rounded off, but still the block-like arrangement of the intervening country is more or less marked throughout the district. Many of the approximately north and south lines are clearly traceable to the strike of the rocks, but in some cases also to faulting in a similar direction, notably in the Macallister valley. The east and west lines have probably been determined in the main by well-developed joints roughly at right angles to the strike ; perhaps also to cross fracture and faulting, though these latter features have not yet been established. This block-like dissection of the country is what might well be expected from well-known principles of stream evolution, when the geological structure of the region is realized. The old high-level strike valleys, less active than their more favoured neighbours, must eventually be invaded by the headward erosion of the lateral streams of the deeper valleys. The right-angled bends and gaps through the ridges illustrate this feature strikingly throughout the district.

Many features present themselves for study in this region, but the difficulty of the country makes the progress of collecting necessary data very slow and laborious. Further remarks, therefore, on many suggestive points must be postponed for the present.

In conclusion, I desire to express my thanks to Mr. G. Ampt, for the careful record of aneroid readings throughout the trip ; to Mr. V. R. M'Nab, for constant assistance in exploring the numerous slopes that had to be climbed ; to Mr. J. Dunn, of the Lands Department, for all the available topographical features of the area, which, though scanty, formed some basis for the sketching in of further details ; and finally to Messrs. J. M'Michael, Peden, and Macfarlane, for true bush hospitality, and also to the latter for guidance and help in the serpentine area.

The views selected for reproduction are :—

No. 1.—View of Tali Karng, looking east from Echo Point, on Riggall's Spur. The lake is half hidden by the upper part of the Barrier. Its area is about 23 acres, with a greatest depth of 150 ft.

It is situated at an elevation of 3,100 ft. above sea level, with the north-west knob of Mt. Wellington rising 2,000 feet above it (on the right). The rocks from the lake level to the top of the plateau consist of porphyritic rhyolites. For theories as to the origin of the lake see *Victorian Naturalist*, vol. xxii., p. 22.

No. 2.—View of the Wellington valley, looking west from the Monument Gap, showing the Serpentine area, with the Crinoline Mountain in the distance. The remnant of the plateau character is shown by the near bluff on the left. Two fault scarps show in the Wellington valley to the right of the centre of the picture. The transverse valley in the foreground is that of the Dolodrook. The nearest hill on the right consists of Ordovician slates. The rest of the ranges consists of Upper Palæozoic rocks.

[The paper was illustrated by a large series of lantern slides.—Ed. *Vict. Nat.*]

On Some Fossils from Silurian Limestone, Dolodrook Valley, Mt. Wellington, Victoria.

By F. Chapman, A.L.S.

Platystrophia biforata, Schlotheim (sp.)

The present examples are very variable, both in size and external characters. The costate ornament passes from the typical stoutly ribbed form figured by Schlotheim into the more finely costate shell exemplified in some British fossils from the Wenlock Series. One at least of these specimens further varies in having bifurcated ribs, after the manner of M'Coy's var. *fissicosta*, from the Ordovician of the Chair of Kildare, Ireland, but with a greater divergence.

This species has a wide geological as well as a geographical range, extending from the Ordovician (Bala Series) to the Wenlock in Great Britain and North America. It is also found in the Silurian of Europe generally. By the occurrence of *Platystrophia biforata* in the Silurian (Yeringian) beds of North Gippsland, it is evident that the species survived longest in this area of the world, so far as at present known.

Crinoid stems, indet.—Fairly numerous.

Pellets of encrusting organisms.—These form a large part of some of the limestones, perhaps as much as 40 or 50 per cent., but their intimate structure has been entirely removed by secondary crystallization, and only traces of their concentric mode of growth can be seen, together with a nucleus of a shell-fragment or crinoid joint.

Similar concentrically structured limestones (pisolite) are also found in the Ordovician of Girvan, Scotland, and of Wenlock, England, as well as in the Island of Gotland. These pisolites owe their origin to an encrusting organism called *Girvanella*.

A fish scale, probably belonging to the rhizodont genus Strepsodus ; ? L. Carb., near Wellington, Dolodrook junction.

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8.—T. S. Hall, M.A.—Victorian Graptolites, part iii., from near Mt. Wellington, Proc. Roy. Soc. Vic., N.S., vol. xviii., part 1, 1905.

9.—E. O. Thiele—On a Palæozoic Serpentine Conglomerate, N. Gippsland, Proc. Roy. Soc. Vic., N.S., vol. xviii., part 1, 1905.

10.—E. O. Thiele—A Trip to Lake Karng and Mt. Wellington, N. Gippsland, *Vict. Naturalist*, vol. xxii., 1905, p. 22.

11.—E. O. Thiele—Notes on the Upper Macallister Valley, N. Gippsland, *Vict. Naturalist*, vol. xxiii., 1906, p. 8.

"THE TASMANIAN NATURALIST."—We welcome the first number of a new contemporary, and congratulate the Tasmanian Field Naturalists' Club on the interesting character of the contents of the first issue of its proceedings. Mr. A. M. Lea, F.E.S., Government Entomologist, deals with that remarkable group of insects the Coccidæ; the hon. secretary, Mr. E. A. Elliott, gives a graphic description of the opening of the Swan-shooting season, and expresses the opinion that the Swan is more in danger of extinction from the quantity of eggs taken yearly than from the number of birds shot ; while Mrs. Roberts gives her experiences in breeding and rearing Bronze-wing Pigeons in an aviary.

THE FRUIT FLY.—Owing to the urgent necessity for every fruit-grower being made acquainted with the appearance of this new pest, the exhaustive illustrated article on the subject by Mr. C. French, F.L.S., Government Entomologist, which appeared in the *Victorian Journal of Agriculture* for May, has been reprinted, and issued as a separate bulletin. All interested are advised to apply to the Secretary for Agriculture, Melbourne, for a copy, and so be prepared to attack this new foe on the first opportunity.

NOTES ON WEB-SPINNING ANTS.

By Edward Jacobson.

(Communicated by F. G. A. Barnard.)

(Read before the Field Naturalists' Club of Victoria, 13th May, 1907.)

Having recently read the papers by Mr. F. P. Dodd on "The Queensland Green Tree Ants," in the *Victorian Naturalist* for January, 1902, vol. xviii., pp. 136, 141, it seems to me to be of interest to give further details of the subject.

The first observation of the web-spinning habits of *Œcophylla smaragdina*, Fabr., seems to have been made by Mr. Ridley, of the Singapore Museum, but I have been unable to find the record in print.

Subsequently independent observations on the same subject were made by Mr. W. D. Holland, of Balagonda, Ceylon, and communicated by Mr. E. Ernest Green to the "Proceedings of the Entomological Society of London for 1896," p. 9. Later Mr. Green published, in the *Journal of the Bombay Natural History Society* for 1900, vol. xiii., p. 181, an article entitled, "Note on the Web-spinning Habits of the Red Ant, *Œcophylla smaragdina*," which contains personal observations.

A short reference, with an illustration, is given in the "Cambridge Natural History—Insects," part ii., by David Sharp.

That the same habit prevails with an Australian ant seems to have been observed first by Mr. Saville-Kent, and, so far as I have been able to ascertain, his observations were even made previous to those of Mr. Ridley, mentioned before. I have, however, been unable to find Mr. Saville-Kent's original record, but his observations were discussed by Professor Marshall in an article, "Spinnende Ameisen," which appeared in the German periodical *Daheim*, No. 52, of 27th September, 1902.

In January, 1903, when staying at Samarang, in Java, I made a number of observations about the nest-spinning habits of *Œcophylla smaragdina*, which lives in Java, as well as on the Asiatic continent (British India, Ceylon, Malacca, &c.) At the time I thought I had made a new discovery, being unaware of previous observations, but on communicating my observations to Mr. C. Ritsema, of the Leyden Museum, I learned that I had been anticipated long ago.

In November, 1904, I found that the same process of web-spinning was practised by a black ant of Java named *Polyrhachis dives*, and was a new fact regarding this species. My observations were published in *Notes from the Leyden Museum*, 1905 (vol. xxv., p. 133), with an introduction from the able pen of Mr. E. Wassman, in which he says the web-spinning, with the aid of larvæ, has also been observed with the African species, *Œcophylla*

longinoda, Latr., by Mr. E. H. Kohl, missionary at Stanleyville, on the Congo.

In the *Biologische Centralblatt*, 1905 (No. 6, p. 170), appeared a communication by A. Forel, entitled "Enige Biologische Beobachtungen des Herrn Prof. E. Göldi an Brasilianischen Ameisen," in which the web-spinning habit is recorded for a Brazilian species, *Camponotus senex*.

These are all the references I have been able to find on the subject, but I regret that I have been unable to see all the articles quoted.

With regard to Mr. Dodd's article, I feel certain that the name *Œcophylla smaragdina* is not correct for the Australian species, which was evidently the writer's opinion also, as indicated by the note of interrogation in the title.

Both the Asiatic and Australian species have been described by Fabricius under the family Formica, the Asiatic being *Œcophylla smaragdina*, and the Australian *Œ. virescens*. In *Œ. smaragdina* the females are green, the males dark brown, and the workers red, hence the popular name, "Red Ant" in English and "Roode Mier" in Dutch.

On the other hand, the workers of the Australian *Œ. virescens* are of the same green colour as their females, whilst the males are, I believe, black.

The description given by Mr. Dodd of the habits of these ants agrees in all details with what I have myself observed in *Œ. smaragdina*, which is not to be wondered at, considering that both species are of the same genus. I have not, however, found any caterpillars or spiders associating with *Œ. smaragdina*, but the fact may have escaped my notice, and I will pay special attention to it on my return to Java next year. The statement that the Australian ant never touches dead lizards, snakes, and birds seems to me doubtful, for *Œ. smaragdina* does, as I found once in a nest of these ants the skeleton of a small lizard, *Platydactylus*, sp., and took a photo. of the nest with its contents.

The larvæ of *Polyrhachis dives*, when being used as a spinning-instrument, continually extends and contracts its "snout," and thereby seems to take an active part in making the thread adhere to the leaves. The larvæ of *Œ. smaragdina* seemed to me to play a more passive *rôle* in the whole proceeding, but this point needs further investigation.

In December, 1905, I discovered at Samarang a small caterpillar which is a parasite of Polyrhachis. It lives in great numbers in the nests of the ants. The caterpillars are enclosed in the web of the nest (which is woven by the ants with the aid of their larvæ) in curious little cocoons, which they make in the shape of two-valved shells. As soon as they can get at the cocoons of the ants, they fasten them with some threads, and then

devour the pupa, after having pierced the cocoon at the bottom. The moth which I reared from the caterpillar does not seem to have been described yet.

A curious fact about the two genera Œcophylla and Polyrhachis is that, although both use their larvæ for spinning, the pupa of the first-mentioned are naked, while those of the latter are provided with a cocoon.

[This paper was forwarded through Mr. F. P. Dodd, of Kuranda, North Queensland, who has added the following note :—"Mr. Jacobson's observations agree well with my own. I have found caterpillars of two species of whitish pyrales, with similar cocoons, in the nests of *Œ. virescens*. Though I have frequently seen dead creatures in the vicinity of the ant habitations, I have only once seen the ants on one—an ibis—and then they were there after the beetles (Staphylinidæ, &c.), infesting it. A dead snake on a tree in occupation of the ants dried here without my ever seeing a green ant on it, though I saw it dozens of times."—Ed. *Vict. Nat.*]

An Introduced Noxious Water-weed.—At the May meeting of the Club I exhibited living and dried specimens of *Elodea canadensis*, Michaux (syn. *Anacharis alsinastrum*, Babington), an aquatic plant belonging to the Nat. Ord. Hydrocharideæ, a native of North America, and which is variously known as "American Water-weed," "Babington's Curse," "Choke-pond Weed," "Snake Weed," and "Water Thyme." The plant is well known to microscopists, owing to the interesting and distinctly marked sap movements which sections display, and some particulars regarding it may be of interest. Some little time ago Mr. W. R. Guilfoyle, Director of the Melbourne Botanical Gardens, had his attention drawn to this plant as growing luxuriantly and fast becoming a menace to all other vegetable aquatic life in the small lake of the Japanese garden at the Treasury Gardens, Melbourne. It was only by emptying the lake, and thoroughly cleaning every particle of the plant from the banks, that the Director endeavoured and hoped to banish this possible scourge from our midst. Its appearance could no more be accounted for in Melbourne than when it was first discovered, almost simultaneously, in different parts of Britain about the middle of the last century. Records show it to be wonderfully rapid in growth, and readily propagated by stem or root division. It has proved itself a great curse wherever it has found a hold in Britain and elsewhere, by destroying the beauty of artificial lakes, and the usefulness of canals and reservoirs and other watercourses and areas. Although it is stated water birds eat the plant, the wider propagation of it is thereby insured, as these fowls pull and divide pieces in the process. The object of showing the specimens was to enable

members to acquaint themselves with the appearance of the plant, in order to endeavour to prevent it (if found by them elsewhere) becoming established, and proving itself the scourge which writers and observers tell us it has been in Europe.—F. PITCHER.

"THE WEEDS AND SUSPECTED POISONOUS PLANTS OF QUEENSLAND."—The first seven parts have been issued of a new publication by Mr. F. M. Bailey, F.L.S., Government Botanist of Queensland, in which he enumerates the weeds, noxious plants, &c., of that State. Each part consists of sixteen medium octavo pages of letterpress and figures. The plants are arranged according to the natural system, and as brief botanical descriptions are given of each order, genus, and species dealt with, the work may almost be used as a systematic botany. The economic, noxious, medical, or other properties of each plant are stated, and, if an exotic, its country of origin, while a distinct advantage is that with nearly every species a drawing, more or less reduced, is given of a typical portion of the plant. Mr. Bailey estimates that about four hundred species will be dealt with in the work, and says that the word "weed" must be taken in a broad sense, that "a plant which is useful in its proper place must be termed a weed when it is found growing in a place set apart for the use of other plants." The work will doubtless be found of great assistance in other States than Queensland, for many of the forms dealt with so far are familiar plants on our roadsides and vacant allotments. It is to be regretted that the author has not in all cases separated his remarks and conclusions from the botanical descriptions, as in his first species, *Ranunculus rivularis*; while the paper used is barely good enough to do justice to the drawings. The work is being published by A. M'Leod, Elizabeth-street, Brisbane, at one shilling per part, or ninepence to subscribers for the whole series (about 16 parts).

[The foregoing note has been in type for some months, but has been crowded out owing to pressure on our space. The work has now been completed, and issued as a volume of 245 pages, with 408 figures, at 12s., or in 15 parts, loose, at 11s. 3d., post free. References to a few fungi, lichens, ferns, mosses, and liverworts are included in the volume.—ED. *Vict. Nat.*]

A NEW LIEBERKUHN.—Mr. M. J. Allen ("Alata," Victoria-parade, East Geelong), of the Geelong Field Naturalists' Club, has devised an improved form of lieberkuhn for illuminating opaque objects when under examination with the microscope, which seems to be of great utility. He is anxious to place it in the hands of every working microscopist, and will be pleased to forward details to any person desiring information on the subject.

BIRD SKINS.—A small collection formed by a deceased member of the F.N.C. for disposal privately. Particulars on application to Mrs. A. G. Whitney, 16 Stanley-avenue, Auburn.

"The Useful Birds of Southern Australia."—Under the above title, at the moderate price of 3s. 6d., Mr. T. C. Lothian has published what is virtually a second edition of Mr. Robert Hall's earlier work, "The Insectivorous Birds of Victoria," thereby indicating that nature study is creating a demand for handbooks. The volume is got up with an attractively coloured cover, depicting some Blue Wrens on a spray of Leptospermum. In the matter of illustrations, the work is an improvement on its predecessor, as a large number of the plates are reproductions of recent photographs by well-known bird observers. Additional information has been included where necessary, as also a chapter on introduced birds, and the work should prove of value to the fruit-grower and agriculturist not less than the naturalist. Nearly 300 birds are dealt with, and we trust that its appearance will lead to the collection of notes suitable for incorporation in future editions.

"The Fishes of Australia."—This is a popular account of our Australian fishes by Mr. D. G. Stead, Naturalist to the Board of Fisheries, New South Wales, and is intended to bring under general notice the great wealth of our fisheries. After an introduction of some twenty pages descriptive of the principal parts of a fish, the colouration, and the systematic classification of Australian fishes, about 250 pages are devoted to brief descriptions and notes on the occurrence of the different species. Owing to the want of unanimity in vernacular naming, this is sometimes confusing; however, it is well illustrated by full-page plates and figures in the text. A final chapter is devoted to the fishing nets used in New South Wales, with references to fish economics, the parts usable, and their food value; the whole forming an extremely useful handbook.

"Victoria: Place-Names and their Origin."—Such is the title of a modest little volume of 72 pages just issued by Mr. J. G. Saxon, as the result of years of patient research and inquiry. The author's position in the Lands Department has afforded him facilities for obtaining the information which he has now placed in the hands of the public. Such a contribution to our scanty historical literature must be of great value in years to come. Some 1,500 or more references are given, and it is pleasing to note that so many of our place-names are derived from the names of places, trees, birds, &c., used by the aboriginals before the advent of white men. The work is on sale at the popular price of one shilling, and is well worthy of perusal.

Microscopes.—Messrs. Watson and Sons, of 78 Swanston-street, Melbourne, have recently issued a new edition of their illustrated priced catalogue of microscopes and accessory apparatus, which can be had on application.

The Victorian Naturalist.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The twenty-seventh annual meeting of the Club was held in the Royal Society's Hall on Monday evening, 10th June, 1907.

The president, Mr. F. G. A. Barnard, occupied the chair, and about 60 members and visitors were present.

REPORTS.

A report of the Club's visit to the Geological Galleries of the National Museum on Saturday, 25th May, was furnished by the leader, Mr. F. Chapman, A.L.S., who stated that twelve members attended. Having made an inspection of the restoration of the skeleton of Diprotodon, recently set up in the lower hall of the Museum, and also of the instructive series of casts showing the progressive stages of types of the horse family, the party were conducted through the Mineralogical and Palæontological Galleries upstairs. Particular attention was paid to the Australian minerals, rocks, and fossils; and the fine zeolites, agates, and quartzes came in for a large share of attention. In the Australian fossil collection the gypsum-replacements of Tertiary shells were pointed out, and some interesting features regarding the uniformity in the direction of cleavage in the specimens were noticed. The microscopists were interested in the structures seen in kerosene and other shales due to vegetable origin, from New South Wales and Tasmania: and also in the spicular structures in the curious sponge-like organism, Receptaculites. What short time remained for the foreign and general Palæontology was devoted principally to the series of fossils—mammals to plants—in the large wall-cases, the arrangement of which had only just been completed. Amongst the more noticeable of these specimens are the model of the Sabre-toothed Cat, the fine skull of the Cave Bear, and the two beautiful casts of the only known examples of the toothed bird, Archæopteryx, the originals of which are in London and Berlin. The lithographic stone in which the last-named fossils were found has also yielded many remains of delicately structured fishes and insects, of which the Museum possesses an exceptionally large collection. A selection of these latter have now been placed on view in the new wall-cases, which contain especially striking examples of insects such as fossil Dragon-flies, Water-bugs, and an ally of the "Walking-sticks." The fossil plants include examples of the recently erected group of the Pteridospermeæ, or earliest seed-bearers, and these, with others of interest, were pointed out to the members.

Owing to Mr. T. S. Hall's inability, through illness, to act as leader on Saturday, 8th June, for the excursion from Fairfield to Camberwell, and no other leader being available at short notice, Mr. G. B. Pritchard, F.G.S., invited the members to join an excursion, in conjunction with the geology students from the Working Men's College, along the Yarra, from Victoria-street Bridge to the Johnston-street Bridge. Mr. R. W. Armitage reported that an interesting and instructive description of the geology of the locality was given by Mr. Pritchard, who pointed out many features of special interest met with during the walk. About twelve members took part in what proved to be a very enjoyable outing, though it is regretted several were unaware of the change and proceeded to Fairfield.

The president, Mr. F. G. A. Barnard, reported that, in place of the usual field excursion, a conversazione for junior members was held in the Club's rooms on Saturday, 1st June. He regretted that the gathering was not quite so successful as on the previous occasion, the attendance being smaller than was anticipated. However, he was pleased to see, among the exhibits shown, a nice collection of Lepidoptera and Coleoptera, taken at Beaconsfield by Masters H. and L. Kershaw. He stated that a number of interesting exhibits were shown by senior members, including objects under the microscope, while he had given a short address, pointing out the advantages of making a hobby of nature study, and called attention to work done in tracing out the life-history of a moth by one of the earliest junior members of the Club.

The hon. librarian reported the receipt of the following donations to the library:—"Memoirs of the Geological Survey of Victoria": No. 4, "The Ballarat East Goldfield," by Prof. J. W. Gregory, D.Sc.; No. 5, "The Berringa Goldfield," by W. Baragwanath, jun.; "Bulletins of Geological Survey of Victoria": No. 19, "Lauriston-Drummond North Goldfield," and No. 20, "Walhalla or Thomson River Copper Mine," by W. Baragwanath, jun.; No. 21, "Mining and Geological Notes of Walhalla and Wood's Point Districts," by E. J. Dunn, F.G.S., and No. 22, "Mount Cudgewa Tinfield," by Prof. Gregory, D.Sc., from the Department of Mines, Melbourne; *Journal of Agriculture of Victoria*, vol. v., parts 4 and 5 (April and May, 1907), from Department of Agriculture, Melbourne; *Agricultural Gazette of New South Wales*, vol. xviii., parts 4 and 5, from Secretary for Agriculture, Sydney; "Annual Report, Department of Mines, New South Wales, 1906," from Secretary for Mines, Sydney; *Geelong Naturalist*, April, 1907, from the Geelong Field Naturalists' Club; "Index to Transactions of Royal Society of South Australia," vol. i.–xxiv., 1877–1900, from the Society; *Tasmanian Naturalist*, vol. i., No. 1, from the Tasmanian Field Naturalists' Club; "Records of Canterbury Museum," vol. i., No. 1, from the Trustees, Christ-

church; "Missouri Botanical Garden—17th Annual Report, 1906," "Proceedings Boston Society of Natural History, 1906," "Annual Reports Smithsonian Institution, 1905, 1906," from the Institute; *Nature Notes*, March and April, 1907, from Selborne Society, London; and *Knowledge*, April and May, 1907, from the publishers.

ELECTIONS.

On a ballot being taken, Mr. E. H. Swan, State school, Somerton, was elected a country member, and Miss Grace Dorword and Masters T. Murray, G. Mitchell, R. Hooker, G. Pender, S. Francis, and C. Martin as junior members.

AUNNAL REPORT.

In the absence of the hon. secretary, Mr. J. A. Kershaw, F.E.S., the assistant secretary, Mr. W. H. A. Roger, then read the twenty-seventh annual report, for the year 1906-7, which was as follows:—

"To the Members of the Field Naturalists' Club of Victoria. Ladies and Gentlemen,—In presenting to you the twenty-seventh annual report, showing the work of the Club during the year ending 30th April, 1907, your committee are pleased to be again in the position to congratulate you on the steadily increasing progress which the Club continues to make, and the sound financial condition which we now enjoy.

"It is encouraging to notice the active interest taken in the proceedings by the members, as shown by the uniformly large attendance at each of our monthly meetings.

"Although many of our members, from various causes, drop away, the number of new ones continually coming forward keep our numbers steadily on the increase. During the year 74 new members were elected, consisting of 20 ordinary, 9 country, 11 associates, and 34 juniors, while 37 names have been removed from the roll owing to resignations and other causes. The total membership of the Club now amounts to 364, comprising 8 honorary, 2 life, 160 ordinary, 50 country, 25 associates, and 119 juniors. Compared with the previous year this shows a loss of 10 ordinary members, while there has been an increase of 11 country, 8 associates, and 28 junior members, or a total over that of the previous year of 37 members.

"Your committee are gratified with the success which has followed the movement relating to junior and associate members. Since its commencement a very large number have been elected, and although, as was anticipated, many have dropped away, new ones are continually coming forward, and there is every reason to assume that the knowledge these have gained of the commoner forms of nature, by means of the short field excursions under the leadership of experienced members, will not be altogether lost. The Club is much indebted to the leaders, who

have given their time and frequently gone to much trouble to stimulate an interest in nature among the young members.

"The number of papers brought before the Club equals that of the previous year. Altogether 28 have been published, and of these 5 relate to zoology, 9 to botany, 5 to geology, 4 to general subjects, and 5 to trips and excursions. Of the zoological papers 4 were devoted to birds and 1 to fish. The authors were—Messrs. F. G. A. Barnard, C. L. Barrett, F. Chapman, A.L.S., Professor A. J. Ewart, D.Sc., Ph.D., J. A. Kershaw, F.E.S., A. Mattingley, A. J. North, C.M.Z.S., A. E. Phillips, G. B. Pritchard, F.G.S., F. M. Reader, F.R.H.S., Dr. C. C. Simpson, Professor W. Baldwin Spencer, C.M.G., F.R.S., Dr. C. S. Sutton, E. O. Thiele, and C. Walter. Several of the papers were illustrated by very fine series of highly interesting lantern views, which have proved not only attractive, but have added considerably to the interest of the subjects dealt with, and have enabled members to follow more clearly the explanations given.

"Short natural history notes on subjects of general interest have been read at nearly every meeting, while remarks on the specimens exhibited have been frequent and instructive. The exhibition of specimens continues to form one of the most interesting features of our monthly meetings, and we take this opportunity to remind members that there is room for considerable expansion in this direction. Exhibits of specimens collected during the Club's excursions add interest to the reports read at the meetings, while more frequent exhibits in subjects such as entomology (particularly life-histories), pond and marine life, are especially desirable, and would be appreciated, particularly by beginners.

"The monthly meetings continue to be well attended, the average throughout the year being about 68. The lowest attendance at any one meeting was 50, the highest being 130.

"A programme of about 20 senior and 11 junior excursions was carried out during the year, and these proved both enjoyable and instructive. The attendances have been satisfactory, while the lively interest shown by those taking part is encouraging to the leaders, and well repays the time and trouble frequently involved.

"The usual Christmas camp was held this year at Mornington, taking on this occasion the form of an instruction camp. It extended from 24th December to the 2nd January, and over 100 persons took part, of whom over 80 spent the time under canvas. Among these were some 50 State school teachers, who, at the invitation of the Club, were selected by the Director of Education, Mr. F. Tate, M.A., who also attended and took great interest in the proceedings. A committee, consisting of Messrs. R. W. Armitage, T. S. Hall, M.A., J. A. Kershaw, F.E.S., J. S. Kitson, E. Lees, and G. B. Pritchard, F.G.S., was appointed to assist the leader, Mr. J. A. Leach, M.Sc., in the management of the camp. An excellent programme was drawn up, providing

for the various branches of natural history being dealt with, a different subject being treated each day under the charge of one of the Club's experts in that particular branch of study.

"Each day was devoted to practical field work, and in the evenings illustrated lectures on kindred subjects were given. Keen enthusiasm was aroused, and each day's proceedings were followed with lively interest. No effort was spared by Mr. Leach and his committee to make this camp the decided success it ultimately proved to be, and the Club is greatly indebted to Mr. Leach, the leaders of excursions, lecturers, and others, who so heartily lent their assistance to bring the outing to such a successful issue, while the special thanks of the Club are due to the press for the valuable reports published from day to day.

"The twenty-third volume of the Club's journal has been completed, under the editorship of Mr. F. G. A. Barnard, to whom the Club is again indebted for the large amount of time and careful thought which he continues to bestow on its successful production.

"The financial position of the Club has permitted your committee to deal more liberally with authors of papers. In the past reprints of papers were provided at cost price, but during the present year it was decided to grant authors of papers containing original matter twenty-five copies free of cost.

"A number of questions of importance were dealt with during the year. Action was taken regarding the destruction of the wattles, &c., growing along the Yarra near the Kew Asylum, with the result that steps were immediately taken to protect the trees. Attention was drawn to the fact that many of the railway and other cuttings near Melbourne, so valuable for illustrating the geological features of the district, were being planted with creeping plants, and there was a danger of these interesting sections being completely covered up. The Railways Commissioners were appealed to, and furnished with a list of the localities which it was desired should be left in their original state, and they at once undertook to carry out, as far as was possible, the wishes of the Club.

"A strong protest against the wholesale slaughter of wild duck which takes place at the opening of the shooting season was forwarded to the Hon. the Minister of Public Works, with a recommendation that some action be taken. Attention was also drawn to the matter through the press, which strongly condemned the practice of making "big bags," and the indiscriminate slaughter which takes place every year, but the results so far have not been satisfactory. It is desirable, however, that the matter should not be allowed to drop, but that further action should be taken at a future date.

"Among other matters carefully considered and dealt with have been suggested alterations in the close seasons for Black Swan

and ducks, the permanent preservation of native pigeons, and the question of the imposition of a gun tax.

"The Club is again greatly indebted to Messrs. T. R. B. Morton and Coghill, who so generously continue to allow your committee the use of their offices for their meetings free of cost. To Mr. J. Searle, hon. lanternist, the thanks of the Club are also due for continuing to gratuitously place his lantern and services at the disposal of the Club.

"The hon. librarian reports that during the year 149 vols. or parts were received by exchange, and 63 vols. or parts were purchased, making an increase of 212 for the term. The number of books borrowed from the library at the monthly meetings was equal to that of last year, but is small in comparison with the number of members present at the meetings. The library now contains a large number of valuable and useful works, covering a wide range of subjects, but its usefulness is greatly curtailed by the want of an up-to-date catalogue by which the members could easily ascertain its contents. This is, no doubt, the cause of the small circulation of books among the members, and the question should be given early consideration. The usual amount of binding has been done during the year.

"Your committee are pleased to report that the financial condition of the Club is still most satisfactory. Starting the year with a credit balance of £105 17s. 9d. we conclude with one of £116 14s. 1d., with all accounts paid. The receipts from all sources amounted to £150 17s. 2d., while the expenditure was £140 os. 10d. The heaviest expenditure was, as usual, incurred in the production of the Club's journal, and every effort is being made to bring this up to the highest state of efficiency.

"Your committee, in conclusion, heartily congratulate the members upon the success which has attended their individual efforts to bring the Club into the prominent position which it now occupies in the scientific world. They look forward to still greater efforts being made by members to communicate the results of their researches, and to interest others in that knowledge and love of nature which all field naturalists should possess.

"F. G. A. BARNARD, *President.*

"*4th June*, 1907." "J. A. KERSHAW, *Hon. Secretary.*

The report having been received, in moving its adoption Mr. O. A. Sayce congratulated members on the very satisfactory position of the Club. Mr. A. D. Hardy seconded the motion, and, in referring to the work accomplished during the year, regretted that the exploration of the Wilson's Promontory had not been completed. He stated that he had received information that there is great slaughter taking place among the wallabies and other native animals on the Promontory.

The Chairman suggested that the exploration of the Promontory should be completed during the ensuing year, to enable

the Club to be in a position to again approach the Government with a view to the appointment of trustees and a caretaker.

After Mr. J. Stickland and others had spoken, the report was unanimously adopted.

FINANCIAL STATEMENT.

The hon. treasurer, Mr. G. Coghill, read the financial statement for 1906–7, which was as follows :—

RECEIPTS.

To Balance, 30th April, 1906				£105 17 9
,, Subscriptions—				
Ordinary Members	£104 19 6			
Country Members ...	20 5 0			
Associates ...	3 17 6			
Juniors	3 3 0			
		£132 5 0*		
,, *Victorian Naturalist*—				
Subscriptions and Sales	5 4 6			
Reprints	3 13 0			
Advertisements ...	6 15 0			
		15 12 6		
,, Sale of Badges		0 14 6		
,, Interest		2 5 2		
			150 17 2	
			£256 14 11	

EXPENDITURE.

By *Victorian Naturalist*—				
Printing	£78 16 6			
Illustrating ...	7 9 4			
Reprints	3 14 6			
Free Reprints ...	3 8 0			
		£93 8 4		
,, Rooms—Rent and Attendance		9 10 6		
,, Library—Periodicals ...	8 14 0			
Books ...	3 13 6			
Binding ...	3 0 9			
Insurance, &c.	1 10 0			
		16 18 3		
,, Wild Flower Exhibition—Expenses ...		0 17 0		
,, Printing and Stationery		4 1 6		
,, Postages, &c.		15 5 3		
			£140 0 10	
,, Balance Melbourne Savings Bank ...		100 0 0		
,, ,, London Bank		16 14 1		
			116 14 1	
			£256 14 11	

G. COGHILL, *Hon. Treasurer.*
23rd May, 1907.

Audited and found correct.

D. BEST,
J. SHEPHARD, } *Auditors.*
28th May, 1907.

* Subscriptions :—Arrears, £11 17s. 6d.; 1906–7, £113 6s. 6d.; 1907–8, £7 1s.—total, £132 5s.

The following statement of assets and liabilities was also read :—

ASSETS.

Balance in Banks	...	£116	14 1
Arrears of Subscriptions (£31), say ...	...	20	0 0
,, for Reprints	...	1	8 0
Library and Furniture (Insurance Value) ...	...	130	0 0
		£268	2 1

LIABILITIES.

Subscriptions paid in advance	...	£7	1 0

The financial statement having been received, Prof. A. J. Ewart, D.Sc., moved its adoption, which was seconded by Mr. A. D. Hardy, F.L.S., and carried.

PRESIDENT'S ADDRESS.

The president, Mr. F. G. A. Barnard, then delivered the following address :—

"THE INCREASE OF THE FACILITIES FOR THE STUDY OF NATURAL HISTORY IN AUSTRALASIA SINCE 1880.

"Ladies and Gentlemen,—On the occasion of our annual meeting last year you did me the honour of listening patiently to an outline of the history of our Club from its inception in 1880. I had hoped that one such address from me would have been sufficient, but your committee, at its meeting last week, persuaded me that a president's address must be one of the items on the business paper for to-night, hence my excuse for again attempting a presidential address.

"In the earlier years of the Club's history our presidents were accustomed on such an occasion to give a review of the principal questions of interest connected with natural history which had arisen during the previous twelve months.

"This I do not feel myself qualified to undertake, but if you will bear with me for a few minutes I will try and point out in how much better a position the natural history student of to-day is than when this Club was founded in 1880.

"Then, I think I am right in saying, the only organization in Australia devoted solely to natural history was the Linnean Society of New South Wales—a society which, owing in a great measure to the munificence of its principal founder, Mr. (afterwards Sir) William Macleay, can, I think, hold its own with any in the world for the quality and quantity of its work.

"The Royal Societies of New South Wales, Victoria, South Australia, and Tasmania, with the New Zealand Institute, which is a federation of local societies, were at that time the only other means through which observers of natural history could get authoritative publication for their theories and observations.

"To enumerate the honoured names connected with natural history in Australia before 1880 is a task beyond me, but a few occur in such names as Joseph Banks, Robert Brown, Thomas Mitchell, Allan Cunningham, John Gould. Would that some able pen would take up the task of placing a brief account of the work of such great men and others in connected form before the present generation of nature students. True, they worked more as collectors than investigators of life-histories, which is now considered the more important side of natural history, but the one is necessary for the other, for in a new country, until your objects have been collected in fairly large numbers, and dealt with from a systematic point of view, it is difficult to see on what lines to investigate the steps in their individual life-histories.

"Turning to our own State we find such men as Mueller, M'Coy, Selwyn, Howitt, and Castelnau laying down the first broad lines of nature study, on which we in later years have been privileged to build, and to some extent fill in the missing details.

"The foundation of this Club was soon followed by that of the Geelong Field Naturalists' Club, which, as might be expected from the smaller population on which it has had to rely, has had a more chequered existence than our own, but nevertheless it has managed, in face of many difficulties, to publish its proceedings at regular intervals, and so make available to the student a large amount of useful information. Societies dealing to some extent with natural science were also established at Ballarat, Bendigo, and Castlemaine, but have ceased to be, for want of support, though I believe that the stimulus which is now being given to nature study throughout the State by the action of the Education Department is likely to result in the re-establishment of the Ballarat Society, if it has not already taken place. At Mortlake a branch of the Geelong Club has been working for some time, and since our last meeting a Field Naturalists' Society has been started at Maryborough with every prospect of success.

"The Australasian Ornithologists' Union, which has its head-quarters in Melbourne, has achieved an immense amount of good work in its own department, and in the *Emu* possesses a quarterly journal of which it may well be proud; while the more recently established (Melbourne) Bird Observers' Club is also directing attention to the same fascinating class of animal life.

"For the study of the minute forms of life we had the Microscopical Society of Victoria, long since deceased, but represented now by the Hawthorn and Camberwell Microscopical Society, which is showing great vitality; and I believe a Microscopical Society has recently been started at Geelong.

"Perhaps owing to the existence and strength of the Linnean Society of New South Wales, it has been difficult in Sydney to keep a society going on the lines of our own Club. After several

have been started and ceased to be, at last the New South Wales Field Naturalists' Club, founded in 1900, seems to have taken hold of the nature lovers in that State, and to be meeting with great success; so much so that last year it commenced the publication of a quarterly journal. However, I cannot help saying here that to take the title *Australian Naturalist* for its publication was hardly justifiable, though at the moment to say what other short title it could have adopted is somewhat difficult, as the name of *Sydney Naturalist* might perhaps have been thought too local to meet all requirements.

"The corresponding society in South Australia is a section of the Royal Society of South Australia, and is nearly as old as our Club. It has always made a great feature of its excursions, and a party of forty or fifty setting out for a drive to the Mount Lofty Ranges has been no uncommon occurrence. With such a man as the late Prof. Ralph Tate to rely on, South Australia has always been well to the fore in natural history investigations, as a glance at the admirable index to the first twenty-four volumes of the proceedings of the Royal Society of South Australia, recently published, will show. This has been excellently compiled by Mr. R. J. M. Clucas, and reflects great credit on his industry and patience. Would that such an index to our *Naturalist* existed.

"Adelaide can, however, claim the establishment of the first junior society for natural history in the Boys' Field Club, which has for many years done good work in encouraging the study of natural history among school boys, and has carried out several 'camps-out' on a very large scale.

"In Queensland, with such a hard worker as Mr. F. M. Bailey for Government Botanist, natural science, mainly botany, has for years been greatly in evidence, while the work of Mr. C. De Vis in zoology, and Dr. Turner and others in entomology, must not be forgotten; but it is only comparatively recently that the Brisbane Field Naturalists' Club has been started, and as yet has not commenced publication of its proceedings. For many years a Natural History Society existed at Rockhampton, but, not having heard of it for some time, I fear it has lapsed.

"Tasmania boasts a Royal Society of considerable antiquity, and in its Proceedings are a large number of papers dealing with natural history. Two years ago a Field Naturalists' Club was founded at Hobart, and in the current number of the *Naturalist* will be found a notice of the first number of the *Tasmanian Naturalist*, which it is to be hoped will have a long and useful career.

"Western Australia was the last of the Australian States to found a scientific society, and I think I am right in saying that the Mueller Botanical Society, founded in 1899 (?) in memory of

the late Baron von Mueller, was the first attempt in that State. The Society is now known as the West Australian Natural History Society, and has published several parts of its Proceedings.

"Of New Zealand I am not able to say much from personal knowledge. A Field Club was established at Dunedin, but I believe it has long ceased to be. Whether there are others in other centres I am unable to say.

"In speaking of societies let me refer lastly to the Australasian Association for the Advancement of Science. Though the association has perhaps not shown results equal to the anticipations of its founders, it has done a considerable amount of good work, and those who have been able to attend its sessions have never regretted the time given for the purpose. Its published proceedings contain a large number of valuable natural history papers, which are apt to be overlooked by the average nature student, in addition to which the local handbooks compiled for the use of members attending the meetings contain information unattainable elsewhere.

"The several museums—Australian (Sydney), Melbourne, and Brisbane—are publishing 'Records' from time to time as material is available and funds permit, while the special catalogues of the first-named institution are very valuable publications. The Western Australian Year-Book, issued by the Government Statist of that State, contains very complete articles on the zoology, botany, and geology of Western Australia.

"The establishment of Agricultural Departments by the several States has done a great deal towards increasing the facilities for nature study throughout Australia, and the publications issued by these departments generally contain one or two well illustrated articles which are of the greatest value to others than purely agriculturists.

"Again, our Education Department, especially through its 'School Papers' and other means, is greatly assisting in the spread of an interest in the things around us; and last, but not least, let me thank the *Argus* for its weekly column of 'Nature Notes,' some of which are worthy of being placed on permanent record.

"It had been my intention to speak of the literature available now as compared with that existing in 1880, but I find the subject is too extensive, and I will conclude with a few references to that of our own State, with the hope that at some future time someone will have the time and opportunity to work out a general bibliography to the natural history of Australia, which, so far as I know, has not yet been done.

"Before 1880, with the exception of such classical works as Brown's 'Prodromus,' Bentham and Mueller's 'Flora Australiensis,' Gould's 'Birds of Australia, and the earlier parts of M'Coy's 'Zoology,' Victorian students had little but scattered

papers in various proceedings and periodicals to refer to, but since that time works dealing with various departments of natural history have become fairly numerous. Most of these have been referred to from time to time in the pages of the *Naturalist*, and therefore I may omit further reference now.

"To show how early an attempt was made in Victoria to popularize natural history, I have here a copy of Mr. S. Hannaford's 'Jottings in Australia,' the scope of which is better described by its secondary title, 'Notes on the Flora and Fauna of Victoria.' This was printed in 1856 by a firm who are still prominent in printing natural history work: I refer to Messrs. Walker, May and Co., the printers of our own journal, *The Emu*, and Mr. Robt. Hall's publications, and to whose business capabilities this Club is greatly indebted. The volume contains a list of the plants common in Victoria, but in the passing of time the names of genera and species, and even of orders, have been so changed that it takes some thought to decide on what plants are listed. A few years later Mr. Hannaford published 'Sea and River-side Rambles in Victoria'—a chatty little book, dealing with all descriptions of natural objects met with at Warrnambool, Geelong, Queenscliff, and around Melbourne. The same author, in 1866, published an equally interesting volume, entitled 'Wild Flowers of Tasmania,' in which there are many references to other objects than plants.

"Perhaps one of the most interesting early volumes on the natural history of Victoria was that published in London in 1861, under the title of 'Bush Wanderings of a Naturalist,' by 'Old Bushman.' The author was Mr. H. W. Wheelwright, who, during 1853–8, spent most of his time in camp near Mordialloc, game shooting for the Melbourne market. Some years ago our member, Mr. A. J. Campbell, contributed an interesting sketch of his life to the *Australasian*, in which he called him 'Victoria's First Field Naturalist,' but I am inclined to think Mr. Hannaford has a better claim to the title.

"It will probably surprise many present to learn that so long ago as 1858 was a sketch of the geology of Boroondara—the district now comprised in the populous suburbs of Hawthorn, Kew, and Camberwell—included in a history of Boroondara published by that indefatigable author, James Bonwick, who only recently passed away in London.

"Doubtless there were other attempts at popularizing our natural history of which I am not aware, and there were no doubt articles published in the newspapers and magazines of the time which would bear perusal at this date, even in the light of our fuller knowledge.

"Now, before I say my last word as president of our Club, let me thank you all for the kindly way in which my failings as a

chairman have been overlooked during the past two years—years which seem to me to have passed all too quickly, allowing me no time in which to think of the responsibilities of the position in which you placed me. For the next twelve months I shall simply be the editor of your journal—a position which, however, is not without its difficulties, though I must confess the work is on the whole pleasant sailing. Finally, I would ask the members and friends of the Club to make an effort to furnish me, in future, with a larger number of short notes of natural history occurrences, many of which I know must come under your observation from time to time. I feel sure your committee will readily allow me to occupy three or four pages monthly with such notes, and by so doing the value and usefulness of the *Naturalist* will be greatly enhanced."

Mr. O. A. Sayce moved that a vote of thanks be accorded Mr. Barnard for his address, which was seconded by Prof. A. J. Ewart, and carried by acclamation.

OFFICE-BEARERS FOR 1907-8.

The following office-bearers, being the only nominations received, were declared elected :—President, Mr. G. A. Keartland; vice-presidents, Professor A. J. Ewart, D.Sc., Ph.D., and Mr. J. A. Leach, M.Sc.; hon. treasurer, Mr. G. Coghill; hon. librarian, Mr. A. D. Hardy, F.L.S.; hon. secretary, Mr. J. A. Kershaw, F.E S.; hon. assistant secretary and assistant librarian, Mr. W. H. A. Roger; hon. editor, Mr. F. G. A. Barnard.

On a ballot being taken for five members of committee, Messrs. J. Gabriel, T. S. Hall, M.A., J. H. Harvey, F. Pitcher, and Dr. C. S. Sutton were duly elected.

A vote of thanks to the retiring office-bearers was moved by Mr. D. Best and seconded by Mr. J. Stickland, and carried by acclamation.

In vacating the president's chair, Mr. Barnard said he felt great satisfaction in being succeeded by Mr. G. A. Keartland, who was one of the oldest members of the Club, a genuine field naturalist, and one who was ever ready to assist in forwarding the interests of the Club.

Mr. Keartland expressed his appreciation of the honour paid to him in electing him president. His twenty years of membership had been a pleasure and a benefit to him, and he would always endeavour to forward the Club's interests. He trusted that the ensuing year would again be a prosperous one for the Club.

Mr. Barnard moved and Mr. F. Pitcher seconded a vote of thanks to the retiring librarian, Mr. J. F. Haase, who from pressure of private business was obliged to relinquish the librarian ship. Mr. Haase briefly replied.

GENERAL BUSINESS.

The question of the suggested alteration in the close season for opossums, which was postponed from the last meeting, was again brought forward for consideration. Mr. G. A. Keartland stated that he had been informed that nearly all the female opossums obtained by a friend in May carried young in their pouches, and he thought that better protection would be afforded these animals if the proposed alteration in the close season were made. He moved—"That the Inspector of Fisheries be informed that this Club recommends the alteration of the close season for opossums from the present dates—viz., 1st June to 31st December—to 1st March to 31st October in each year." Mr. G. Coghill said he would prefer to see these animals protected during the whole year. Mr. R. W. Armitage seconded the motion, which was carried.

A letter was received from the Inspector of Fisheries, in which he stated that it had been brought under his notice "that seals are destroying a lot of fish in Western Port," and that on "some days from 1,000 to 2,000 of them can be seen basking on the Seal Rocks at the entrance." The fishermen also complained of the destruction of fish by seals, which, it is alleged, are useless. He desired the opinion of the Club on the matter of continuing or modifying the present close season.

Mr. Barnard explained that seals were at present protected for the whole year.

Mr. Gabriel expressed the opinion that seals do very little harm.

Mr. O. A. Sayce moved, and Mr. J. H. Harvey seconded—"That the matter be left in the hands of the committee for consideration," which was carried.

NATURAL HISTORY NOTE.

Mr. J. P. M'Lennan contributed a note on the action of a saw-fly, *Perga lewisii*, Westw., regarding an ichneumon fly, *Bracon capitata*, specimens of which he exhibited.

EXHIBITS.

By Mr. F. G. A. Barnard.—Copies of Hannaford's "Jottings in Australia" and "Sea and River-side Rambles in Victoria;" Wheelwright's "Bush Wanderings of a Naturalist;" and Bonwick's "History of Boroondara," referred to in his presidential address.

By Miss S. W. L. Cochrane.—Paintings of orchid, *Dendrobium speciosum*, Rock Lily, and the Pink Eucalyptus, *E. ficifolia*.

By Miss C. Cowle.—Dried specimens of *Pomaderris lanigera*, *Boronia ledifolia*, *Lambertia formosa*, *Petrophila pulchella*, *Viminaria denudata*, *Blandfordia nobilis*, &c., from Blue Mountains, &c., New South Wales; also series of photographic views of the Jenolan Caves and Blue Mountains, New South Wales.

By Mr. C. F. Cole.—Stuffed specimens of Southern Blue-tongue Lizard, *Tiliqua nigrolutea*, including male and female, with three young removed in dissecting.

By Mr. J. E. Dixon.— Kern or mill used by aborigines for grinding pigments, seeds, &c., also three chipped stone axes, from Deep Creek, near Bulla.

By Professor A. J. Ewart, D.Sc., Ph.D.—Dried specimens of *Cassinia arcuata*, R. Br. ; type form ; distribution—W.A., S.A., V., and N.S.W. ; and *Cassinia theodori*, F. v. M. ; type form ; a native of N.S.W. only. Also specimen of *Cassinia arcuata*, R. Br., from Doncaster, Victoria, collected by Mr. Paton, 1894 ; wrongly determined as *C. theodori*, and not subsequently corrected. In consequence of this error in determination it has been supposed that *C. theodori* is a native of Victoria as well as of New South Wales, which is not so. All the specimens of the supposed Victorian *C. theodori* hitherto seen were without doubt *C. arcuata*, R. Br. From its peculiar odour *C. arcuata*, R. Br., is known in some parts of Victoria as "Chinese Scrub," and it has been proclaimed as a noxious plant in some shires.

By Mr. J. P. M'Lennan.—Specimens of saw-fly, *Perga*, sp., with larvæ and eggs, also ichneumon fly, in illustration of his note ; also aboriginal stone axe, found by Mr. R. Gay at Noojee, on a high spur in very rough country, made from the slate common in the district.

After the usual conversazione, the meeting terminated.

The Plants of the Grampians.—I had the idea, and perhaps others have also, that certain plants said to be confined to Mt. William (3,827 feet) were found only about the summit of that peak. While on a recent holiday visit I discovered great quantities of *Candollea sobolifera* (in fruit). I have also collected this plant on the southern end of the Sierras, near Dunkeld. Some seven miles from Mt. William, on the footslope of the next range, at an elevation of not more than 800 feet above sea level, in the gully which separates Mt. William from the next peak, the Redman, at about the same height, are thickets of *Bauera sessiliflora*, a few flowers being out at Easter. Here, too, were seen some enormous plants of the fern *Lomaria discolor*, with very graceful fronds fully five feet in length. Mrs. Barnes, of Pomonal, showed me a fine plant of *L. discolor*, var. *bipinnatifida*, in the garden, which she said she found in the ranges behind some years ago. On the top of Mt. William a few trees of *Eucalyptus alpina* were in flower. The local residents take this stunted eucalypt to be the dwarfed form of the stringybark, *E. capitellata*, so common on all the lower parts of the ranges. It is said to exist in many other places as well, on the Redman, which can be seen over the valley, rising to nearly the same height as Mt. William, and as far south as Mt. Abrupt, near Dunkeld.—A. G. Campbell.

CONTRIBUTIONS TO THE FLORA OF AUSTRALIA.

No. V.*

By A. J. Ewart, Ph.D., D.Sc., F.L.S., &c., Government Botanist.

(*Read before the Field Naturalists' Club of Victoria, 13th May*, 1907.)

Anthocercis odgersii, F. v. M.—Solanaceæ.

The record given of this species in the "Census of Australian Plants" is incorrect. Mueller evidently confused Victoria Springs with Victoria River. The correct locality is Queen Victoria Springs, Western Australia, Young.

In consequence the record given of this plant from Cowcowing, Western Australia, Koch, in the *Victorian Naturalist*, vol. xxiii., page 155, as being new for W.A., is an error based on Mueller's record. The record should be W.A., not N.A.

Dendrobium fellowsii, F. v. M. = *D. gracilicaule*, F. v. M.—Orchidaceæ.

This species is retained as a valid one in the "Kew Index," although considered by Bentham to be based on error, and omitted by Baron von Mueller from the later editions of the "Census." The only specimen extant consists of a shrivelled stem bearing flowerless racemes, two leaves, and a few flowers found on the ground. The flowers were considered by Bentham to belong to *D. gracilicaule*, F. v. M., and the stem to *D. smillieæ*. The latter is, however, an error. Careful examination shows clearly that the stem and racemes also belong to *D. gracilicaule*, the peculiarity being that a greater number of racemes have broken out earlier than usual, while the upper nodes are less elongated, and still covered by the sheathing bases of the fallen foliage leaves. Peculiarities of this kind are common among orchids of this character, and *D. fellowsii* is, therefore, merely a slightly abnormal state of *D. gracilicaule*, F. v. M. The retention of this species in the "Kew Index" is possibly due to the fact that Baron von Mueller did not publish the reasons for its suppression.

Eucalyptus leichhardtii, Bailey, *Queensland Agricultural Journal*, 1906, vol. xvi., p. 493 = E. eximia, Schau., var. leichhardtii, Bailey—Myrtaceæ.

In the case of a genus such as *Eucalyptus*, with its known variability, it might be expected that some caution would be exercised in founding new species, except upon well marked, constant, and distinctive characteristics, especially when, as in this case, specimens of the plant had already been referred by

* No. I., in *Vict. Nat.*, vol. xxiii., p. 42; No. II., in Proc. Royal Soc. of Vict., vol. xix., part ii., p. 33; No. III., in *Vict. Nat.*, vol. xxiv., p. 12; No. IV., in *Vict. Nat.*, vol. xxiv., p. 15.

a great authority (Baron von Mueller) to an existent species (*E. eximia*). It is, however, difficult to see any grounds for the description of a new species in this case, as can be seen from the following quotations:—

E. EXIMIA, from Bentham's "Flora," p. 258.

A large tree.

Leaves falcate lanceolate, mostly 4 to 6 inches long, acuminate, with numerous veins, fine and parallel, but scarcely visible owing to the thick, coriaceous texture.

Flowers several together, closely sessile, in heads which are usually arranged on thick angular or flattened peduncles in terminal corymbs or panicles.

Calyx tube thick, obconical, somewhat angular, much tapering at the base, 3 to 4 lines long.

Operculum broadly conical or shortly acuminate, always much shorter than the calyx tube, and doubled as in *E. maculata*.

Stamens 3 to 4 lines long, anthers ovate oblong, the cells parallel, opening longitudinally.

Ovary short, flat topped.

Fruit urceolate, ¾ to 1 inch long, the rim thin, the capsule deeply sunk.

E. LEICHHARDTII, Bailey, in *Queensland Agricultural Journal*, 1906, vol. xvi., p. 493.

A tree of small size.

Leaves falcate lanceolate, 3 to 6 inches long, the apex often elongated and filiform, transverse parallel veins very numerous, but not very distinct, owing to the coriaceous texture of the leaf.

Flowers several together, nearly or quite sessile, in heads which are arranged in thickish (more or less angular) branches of a terminal panicle.

Calyx tube thick, angular-rugose, much tapering towards the base, in the flower about 4 lines long.

Operculum broadly conical or shortly acuminate, considerably shorter than the calyx tube, and doubled as Mueller describes for *E. eximia*.

Stamens 3 to 4 lines long, anthers oblong, cells parallel, opening longitudinally.

Ovary flat topped.

Fruit urceolate, about 6 lines long, rim rather thin, capsule deeply sunk.

The bark is the same in both "species," and no doubt can exist but that we are dealing with a somewhat dwarfed form of *E. eximia*. As the leaves and fruit are also somewhat smaller than in the type form, it may be distinguished as a variety, although its constancy has yet to be determined. A point apparently overlooked by Bailey is that the internal ledge just within the rim is nearly horizontal, instead of sloping inwards and downwards as in *E. eximia* type, so that the outer chamber of the fruit is saucer-shaped instead of cup-shaped. In this respect, as well as in the size of the fruit, the capsules show an approach to *E. maculata*, but in the bark, and in other features, the two trees differ considerably.

HEMIGENIA MACPHERSONI, Luehmann (syn. *H. macphersoni*, Diels)—Labiatæ.

This plant, described fully by Luehmann in the *Victorian Naturalist* for June, 1898, has been redescribed in Diels and Pritzel's "Fragmenta Phytographiæ Australiæ Occidentalis," 1905, p. 528, as *Hemigenia macphersoni*, Diels, n. sp. The descriptions are identical, and the figure might have been drawn

from one of the specimens in the National Herbarium. This redescription is the more extraordinary since the type specimens were seen by Diels and Pritzel in March, 1902, at the National Herbarium, when they were allowed unprecedented latitude in working through, and even taking specimens from, the Herbarium. The same collector is given in both cases, and the locality, Mount Margaret, is clearly a misreading for Mount Magnet.

HYDROCOTYLE CANDOLLEI, F. v. M. = H. LAXIFLORA, D. C.—Umbelliferæ.

H. candollei is given by Mueller in the 1889 "Census," and also in the "Key to Victorian Plants," p. 267. It is merely a synonym for *H. laxiflora*, D. C. De Candolle originally considered that *H. laxiflora* and *H. densiflora* were distinct species, but Bentham showed that the plant was dimorphic, and correctly made *H. densiflora*, D. C., a synonym to *H. laxiflora*. The name put forward by Mueller simply adds a useless and unjustifiable synonym to botanical nomenclature.

LACHNOSTACHYS VERBASCIFOLIA, F. v. M., var. PANICULATA (syn. *Lachnostachys dempsteri*, Pritzel)—Verbenaceæ.

Between Esperance Bay and Fraser's Range.

Dempster, 1884, 85 miles N.E. from Esperance Bay, W.A.; Elder Exploring Expedition, 1881.

This is the *L. albicans* of the Elder Exploring Expedition, from which species, however, the plant is quite distinct. It differs from the type species of *L. verbascifolia* in the more compound inflorescence and shorter tomentum, as was noted by F. v. Mueller. The leaves have margins which are either not revolute or only slightly so, but otherwise closely resemble the type. In the inflorescence and lessened tomentum the variety shows an approach to *L. walcotti*, from which, however, the leaves at once distinguish it. The plant has been described by Diels and Pritzel, Frag. Phyt. Aust. Occid., p. 512, as a new species, "*L. dempsteri*, Pritzel, from the Melbourne Herbarium, confused with *L. verbascifolia* by F. v. Mueller." Mueller recognized the plant as a variety, although he did not specifically name it. Had Pritzel examined all the material at the Herbarium, he would have come to the same conclusion. The Elder Exploring Expedition specimen was apparently not seen by Pritzel.

LEPYRODIA SCARIOSA, R. Br.—Restiaceæ.

Glenelg, County of Follett, F. M. Reader. New locality for Victoria.

LOBELIA TOPPII, Luehmann—Campanulaceæ = L. GIBBOSA, Labill. (*L. microsperma*, F. v. M.)—Lobeliaceæ.

The description and figure of *L. toppii* in the *Vict. Nat.*, vol.

xvii., 1900, p. 169, at once suggests *L. gibbosa*, and this is confirmed by comparison of the type specimens. Those of *L. toppii* are simply the upper parts of the stems, from which most of the leaves have fallen. "Leaves replaced by scales" applies only to the upper part of the flowering axis, just as in *L. gibbosa*. These specimens do not show a single constant feature which is not also shown by undoubted specimens of *L. gibbosa*, so that the plants cannot even be classed as a variety of that species. It is sincerely to be regretted that Mr. Topp's services to the Field Naturalists' Club were not signalized by attaching his name to a valid species.

Another species of Lobelia (*Lobelia gustafsenii*, F. v. M., M.S., W.A., 1889) may possibly need suppression at a later date, and three others at once. These are *L. browniana*, R. and G.; *L. simplicicaulis*, R. Br.; and *L. microsperma*, F. v. M. The latter three species form the *L gibbosa*, Labill., and were revived by Baron von Mueller, in opposition to the opinions of Bentham and of Sir J. D. Hooker. They appear to form three fairly strongly marked varieties of *L. gibbosa*, but with intervening forms and without any strongly marked and constant distinctive features.

Solanum vescum, F. v. M. (Trans. Vict. Inst., 1855, p. 69) = Solanum aviculare, Forst., var. vescum, F. v. M.—Solanaceæ.

The characters relied upon by Mueller to distinguish *S. vescum* from *S. aviculare* are none of them constant (sessile decurrent leaves, relatively longer filaments, less deeply lobed corollas, and edible globular greenish berries). Specimens with edible globular greenish berries may have stalked and non-decurrent leaves, and the lobing of the corolla varies somewhat in different specimens. Typical specimens of *S. aviculare* with ovoid yellow inedible berries may show a more or less marked approach to the decurrent condition. Nevertheless the four characters occur together sufficiently frequently to justify the recognition of a variety *vescum* of this highly variable species *S. aviculare*, although many specimens might be placed either with the variety or the type species. *Solanum vescum*, though suppressed by Bentham, was retained by Mueller in the "Census," but can be no longer upheld against the evidence afforded by numerous transitional specimens since received.

Stylidium maitlandianum, Pritzel (Frag. Phyt. Aust. Occid., p. 593) = S. striatum, Lindl.—Stylidieæ.

This species is based by Pritzel upon the fact that the flowers are violet instead of rose colour, upon the shape of the leaves, and upon the presence of an irregular thin scarious margin to the

leaves. The shape of the leaves is, however, well within the range of variation of the species; the shade of colouration in the flowers also varies, and the membranous edge, which is unusually well shown in Pritzel's specimen, is feebly developed here and there on the edges of some specimens, forms a distinct irregular margin on others, especially on 348 and 349 of Drummond's 5th Collection, classed by Bentham as var. *glaucum*. A few scattered hair-like prolongations are present on the edges of some of the leaves, which were apparently overlooked by Bentham. Since the margin may vary on the leaves of the same specimen, it is not possible even to distinguish Pritzel's "species" as a definite variety distinct from var. *glaucum*.

TRIGLOCHIN TURRIFERA, Lueh., Juncaginaceæ = TRIGLOCHIN CALCITRAPA, Hook. ?—Naiadaceæ.

The former name was published provisionally (*Vict. Nat.*, 1906, p. 43) from material collected and named by Mr. Luehmann.

Mr. Reader suggested (*Vict. Nat.*, 1906, p. 120) that the plants in question could be classed as a variety of *T. calcitrapa*. This is confirmed by Dr. Graebner, of the Berlin Botanical Gardens, so that the provisional name of *T. turrifera* may be suppressed.

XANTHOSIA SILVATICA, Diels (Frag. Phyt. Aust. Occid., p. 455) = XANTHOSIA PELTIGERA, Benth.—Umbelliferæ.

This plant does not differ in any feature from *X. peltigera*, and Diels' specimen exactly matches one in the Melbourne Herbarium examined by Bentham. Since this specimen was seen by Diels in May, 1902, it is difficult to see how this remarkable oversight has arisen.

ICHNEUMON MAIMED BY SAW-FLY.—During the end of April and beginning of May I had under observation a saw-fly, *Perga lewisii*, Westw., guarding its larvæ on a branch of *Eucalyptus amygdalina*. On the 6th of May I noticed an ichneumon amongst the larvæ, while the saw-fly was on the leaf, apparently contentedly watching. Mr. Edmund Jarvis and myself examined the ichneumon, and found that its antennæ and ovipositor were missing. While it was under the influence of a dose of cyanide of potassium Mr. Jarvis noticed it eject some eggs through the remaining stump of the ovipositor. The incident is interesting, as it is probably the first case recorded of this species of Perga having rendered the parasite harmless. In the accompanying exhibit the ichneumon minus its antennæ and ovipositor is shown; the eggs can hardly be seen, as they have shrivelled, but an enlarged drawing is shown.—J. P. M'LENNAN. Emerald, Victoria, 8/6/07.

THE NEGATIVE PHOTOTAXIS OF BLOW-FLY LARVÆ.

By Prof. A. J. Ewart, Ph.D., D.Sc., F.L.S., &c.

(*Read before the Field Naturalists' Club of Victoria, 13th May*, 1907.)

On moving a heap of manure recently many thousands of active maggots were left behind, and it was noticed that these immediately began to crawl rapidly towards some loose earth lying at the foot of a tree, in which they buried themselves, traversing a distance of 5 to 12 feet before doing so. The phenomenon was a remarkable one, since hundreds of the larvæ could be seen crawling rapidly in an almost straight course for the base of the tree, without a single one progressing in the opposite direction or diverging to any extent laterally. That the movement was not directed by ordinary vision or by smell is shown by the fact that a piece of manure placed within an inch of the maggots on the outward side did not attract them, and that they passed such heaps unnoticed unless they were actually in their path. In the latter case the larvæ at once buried themselves in the heap. The path of movement towards the tree was slightly down hill, but on changing the position of the grubs they crawled up hill towards the same destination, and also crossed a ridge of hard soil placed across their downward path. Evidently, therefore, the response is not a geotropic one.

The only remaining directive agency is light. In crawling towards the tree they steadily progressed towards light of less and less intensity, and the finding of loose soil at the base of the tree was purely an accident, for if any of the soil was loosened in their path they buried themselves in it, and also crawled into and remained in little inverted boxes of black paper placed before them. On repeating the observations with fresh material at night time the repellant action of a strong beam of light was very obvious, any portion of ground on which the light was turned being soon cleared of grubs, and by manipulating the light the grubs could be driven in a particular direction like a flock of sheep. In feeble light the grubs often do not know which way to turn, and may move irregularly, but even then the majority can be seen to avoid the light either by crawling away laterally or by burying themselves in any loose material at hand. They will do the latter even in darkness, and undoubtedly possess a strong sense of contact. It is evident from the observations recorded that they also possess a strong negative phototactic irritability, such as is shown in equal degree by many of the freely motile lower plants.

The latent period of response is from 1 to 3 seconds, and since the larvæ move with a speed of about a foot a minute, a narrow beam of strong light may be crossed by them with

no other effect than to produce a few uncertain movements after they have passed it; but a broad beam, if the light is strong enough, always stops them. It is very probable that the larvæ of the Codlin Moth also possess a negatively phototatic irritability which causes them to hide in the dark folds of cloth bound around the infested trees, but experiments are needed to determine this, and also whether they possess any geotactic sense. It would be of interest if it were found that the imago and the larvæ possessed precisely opposite phototactic senses, or at least gave opposed responses to the same light stimulus. Many plants give changed responses to light according to the conditions or stage of development, and this may apply to animals also.

Wild Life in Australia. By W. H. Dudley Le Souëf, C.M.Z.S., M.B.O.U., &c., Director Zoological Gardens, Melbourne. Melbourne: Whitcombe and Tombs Ltd. 439 + xv. pp. 7s. 6d.

In this profusely illustrated volume the author has made available to naturalists all over the world the experiences of a lifetime among the birds and animals of Australia. The work really consists of a series of accounts of collecting trips made to various portions of the States. Thus for Victoria we have chapters devoted to the Gembrook district, the Western District, and Mallacoota Inlet. For New South Wales is given an account of Riverina, with its wealth of bird-life on its numerous rivers and swamps. Sea-bird life is dealt with in visits to the Furneaux Group and to the Hunter Group and Albatross Island in Bass Strait; while North Queensland and South-western Australia are levied on for the life of the more distant parts of the continent. The author enters just sufficiently into such details as life-histories or protective colouration as to whet the appetite of the reader and stimulate him to extend his reading, though whenever a much-disputed point, such as the existence of the bunyip, the sea-serpent myth, or the mystery of the early life of the young kangaroo, arises, he is ready to advance his opinion, and support it by sound deductions. Much of the matter has already appeared in the *Victorian Naturalist* or the *Emu*, but it does not suffer from repetition, and in its present form will, we hope, reach a larger circle of readers. The illustrations embrace a great variety of subjects, and will go a long way towards establishing a correct idea of the life in the Australian bush. The majority are reproductions from the author's own camera, while Mr. A. H. Mattingley, Mr. E. M. Cornwall, the late Mr. H. P. C. Ashworth, &c., are worthily represented by characteristic work. The author has not burdened his text with many specific names, having adopted the plan of a separate scientific index at the end of the volume, while there is also a comprehensive general index. The get-up of the book is all that could be desired, and we trust it will have a ready sale.

Australian Insects. By Walter W. Froggatt, F.L.S., Government Entomologist of New South Wales. With 37 plates, containing 270 figures, also 180 text blocks. 450 + xiv. pp. Sydney, 1907 : Wm. Brooks and Co. Ltd. 15s.

Australian entomologists owe a debt of gratitude to Mr. Froggatt for his masterly volume on the insects of our island continent, and by the process of reasoning the Field Naturalists' Club of Victoria can to some extent claim a share of their thanks; for when in August, 1905, Mr. Froggatt gave a presidential address to the New South Wales Naturalists' Club, he said :—

"Nearly twenty-five years ago I was collecting beetles, and gaining colonial experience, in the north-west corner of New South Wales, known then as the Grey Ranges, now as Milparinka, when I heard that a party of ladies and gentlemen had met together in Melbourne and founded a Field Naturalists' Club. On my return to civilization I communicated with several members, and, through the courtesy of Mr. Charles French, then in the Botanic Gardens, and as ardent a beetle collector then as now, I began to name up my collections. After that my interest in natural history never flagged. I had always been a bush naturalist, but the assistance gained from the F.N.C. of Victoria set me on a definite track, and I therefore consider I owe a great deal to our first Field Naturalists' Club."

The work is a handsome octavo volume of 450 pages, and will form a sure foundation on which our entomologists can set to work and re-arrange and name their collections. The classification of insects, like that of any other group in natural history, is always a matter of individual opinion; in the volume under notice the author has closely followed that of the "Cambridge Natural History," with one notable exception—he places the Termitidæ (white ants) and allied families in the Orthoptera, after the Blattidæ (cockroaches). The orders are dealt with in the following sequence:—Aptera, Orthoptera, Neuroptera, Hymenoptera, Coleoptera, Lepidoptera (sub-orders Rhopalocera and Heterocera), Diptera, Hemiptera (sub-orders Homoptera, Anoplura, and Mallophaga), and Thysanoptera. It must not be supposed that every genus of Australian insect is dealt with in the volume—that would be impossible—but the author mentions sufficient to enable most of our larger insects to be identified, as also those which are proving themselves pests or injurious to vegetation, &c., and while serving as a text-book the descriptions of life-histories given afford most interesting reading. He is to be congratulated on the adoption of familiar English names for most of the families and almost all the species illustrated. The plates and illustrations are in all cases very clearly executed, and in many of them the insects are figured on an enlarged scale, which makes them doubly useful. In a short notice like this it is impossible to call attention to the many points one would like to do. The work concludes with three useful chapters—viz., on the collection and preservation of

insects ; museum collections and types, in which brief references are given to the leading public and private collections in Australia; and publications dealing with Australian entomology, showing what few advantages the Australian collector has hitherto had in the way of literature. With the publication of this work we can confidently look forward to increased enthusiasm and a new era in Australian entomology.

THE PLOVERS.—Two of the commonest birds on the Western Plains (Victoria) are the Spur-winged Plover, *Lobivanellus lobatus*, Lath., and the Black-breasted Plover, *Zonifer tricolor*, Vieill. They are both handsome birds, and they are real Victorians, in that they never leave the district from one year's end to the other. But we have other plovers, which are not nearly so numerous, and which are only visitors. Early in April I came across quite a flock of Grey Plovers, *Squatarola helvetica*, Linn., on the plains near Lismore. They were feeding amongst the stones on a hillside, and harmonized wonderfully with the ground. They are very plain-looking birds, as compared with either the Spur-winged or Black-breasted Plovers. It is a curious fact that, though this plover is found pretty well all over the world, its only known breeding-place is Siberia. As we only see the birds in the "off" season, we see them at their worst. Mr. A. J. Campbell remarks that in the breeding season the plumage on the belly turns to a rich black, while the back becomes a beautiful dappled-grey. Unlike our own plovers, the visitors when disturbed make no noise. Doubtless, however, they have plenty to say in the breeding season.—"F.R.," *Australasian*, 29/6/07.

MYXONEMA TENUE.—At the meeting of the Royal Microscopical Society of London held on 20th March last a paper was read by Dr. Hebb, for Mr. A. D. Hardy, F.L.S., F.R.M.S., entitled, "Notes on a Peculiar Habitat of a Chlorophyte, *Myxonema tenue*." This alga is usually found in rapidly-flowing water, frequently attached to the submerged parts of riverside plants, but more often to stones and dead twigs. It is also found in stone-paved gutters where there is a rapid flow of water. The author, however, found it growing feebly in a small fishpond about 10 feet in diameter, where the water was nearly stagnant; while on some goldfish in the pond it grew luxuriantly, and the author thought that some interest attaches to the adaptation of this stream-loving Myxonema, which, unable to thrive in stagnant water, yet flourished on moving objects, where it obtained the necessary water-friction. It may be added that the effect of this algal growth on the fish was their premature death.—*English Mechanic*, 12/4/07.

The Victorian Naturalist.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 8th July, 1907.

The president, Mr. G. A. Keartland, occupied the chair, and about 55 members and visitors were present.

ELECTIONS.

On a ballot being taken, Mrs. Marion Champlin, Barry-street, Kew, was duly elected an ordinary member of the Club.

LIBRARIAN'S REPORT.

The hon. librarian acknowledged the following donations to the library :—"Records of the Geological Survey of Victoria," 1907, vol. ii., part 1, from the Department of Mines, Melbourne ; *The Journal of Agriculture of Victoria*, vol. v., part 6, June, 1907, from Department of Agriculture, Melbourne ; *The Emu*, vol. vii., part 1, July, 1907, from the Australasian Ornithologists' Union ; "Records of the Geological Survey of New South Wales," vol. viii., part 3, 1907, from the Secretary for Mines, Sydney ; "Forest Flora of New South Wales," by J. H. Maiden, F.L.S., Government Botanist, vol. iii., parts 4 and 5, from the Forest Department, Sydney ; *Agricultural Gazette of New South Wales*, vol. viii., part 6, June, 1907, from Secretary for Agriculture, Sydney ; "Proceedings Linnean Society of New South Wales," vol. xxxii., part 1, 1907, from the Society ; "Papers and Proceedings, Royal Society of Tasmania," 1903–5 (issued March, 1906), from the Society ; "Catalogue of the Plants of New Zealand," by T. F. Cheesman, F.L.S., from the Education Department, Wellington ; "Proceedings and Transactions of Nova Scotian Institute of Science," vol. xi., part 2, 1903–4, from the Institute ; "Bulletin of Buffalo (U.S.A.) Society of Natural Science," vol. viii., No. 4, from the Society; "Nature Notes," May, 1907, from the Selborne Society, London ; and "Australian Insects," by W. W. Froggatt, F.L.S., Government Entomologist, New South Wales (purchased).

GENERAL BUSINESS.

Professor A. J. Ewart, D.Sc, Ph.D., gave notice that he would move at the next meeting of the Club—"That with regard to all plants exhibited at the Field Naturalists' Club meetings, or recorded in the *Victorian Naturalist* as new to science, to the State, or its districts, at least one specimen of each such plant

shall become the property of the Field Naturalists' Club, and shall be deposited for reference either in the Club's rooms or in the National Herbarium, and that unless this condition be fulfilled no record shall be accepted for publication except by resolution of the committee for the time being."

Mr. F. G. A. Barnard drew attention to the necessity of again taking some action to prevent the destruction of the wattle in the neighbourhood of Melbourne, and moved—"That the hon. secretary be instructed to communicate with the press with a view to enlisting the support of the public in the matter." This was seconded by Dr. J. C. Kaufmann, and carried.

Mr. E. O. A. Thiele stated that a large area of valuable forest in the Marysville district, extending from Tommy's Bend to Cumberland Creek, and which at one time contained trees of magnificent size and great variety, had been desolated by fire. He mentioned that the irreparable loss of this valuable stretch of forest could not have been accidental, but pointed to the work of people who during the summer months run their cattle in these highlands. He suggested that the Club might take some action in the matter.

The president thought that it would be as well for the Committee to take the question into consideration and see what could be done to stop such practices.

PAPERS READ.

1. By Mr. Isaac Batey, entitled "The Animal-Life of Sunbury District Sixty Years Ago." Communicated by Mr. A. G. Campbell.

The author dealt principally with the mammals existing in this district from about the year 1846, enumerating the species met with, together with notes on their habits, &c.

Mr. T. S. Hall, M.A., remarked on the interest attached to such early records of our native fauna, and in the course of his remarks mentioned that evidence was desired as to whether the Native Cat, *Dasyurus geoffroyi*, Gld., inhabited the southern parts of the State. Although very rare in Victoria, it was known to inhabit the N. and N.W. districts bordering the Murray, and any evidence of its occurrence in the southern districts would be particularly valuable. In size and general appearance it closely resembled the common Dasyure, *D. viverrinus*, Shaw., from which it was readily distinguished by the presence of a hallux, or great toe, and the tail, except in melanistic varieties, being more or less black towards the tip.

2. By Mr. C. F. Cole, entitled "Bird-Life in the Nagambie District."

The author gave an interesting account of a week spent, in

March last, among the birds on the backwaters of the Goulburn River, near Nagambie, together with a list of sixty-seven species met with.

Mr. G. Coghill congratulated the author on his interesting notes, and remarked that members would no doubt be glad to know of this locality as deserving of further research.

Mr. G. A. Keartland remarked that the note regarding the movements of the Bee-eaters, *Merops ornatus*, during the time of the year mentioned was very interesting.

3. By Professor A. J. Ewart, D.Sc, Ph.D., entitled "On Supposed New Records for Victorian Plants."

The author dealt with a list of plants which had been published in the Club's journal in 1889 as new records for Victoria or its districts, but which, he stated, had nearly all been previously recorded. He made special reference to the confusion created by the publication of such misleading statements, and the difficulty of ascertaining their correctness in the absence of specimens of the plants dealt with. With a view to preventing to a great extent such mistakes, he thought it desirable that the Club should adopt a rule, such as he had already given notice of, providing that at least one specimen of each plant exhibited at the Club's meetings or recorded in the *Victorian Naturalist* as new to science, to the State, or its districts, should become the property of the Club, to be deposited for reference either in the Club's rooms or in the National Herbarium, and that unless this condition be fulfilled no record should be accepted for publication, except by a resolution of the committee.

In the discussion which followed, Mr. F. G. A. Barnard said that he had often feared that some of the specimens exhibited at the Club's meetings, and recorded as new by the various exhibitors, would prove not to be so when the proceedings of various societies were more closely examined, and pointed out that the Club was not in any way responsible for the record, it being entirely the statement of the exhibitor.

Mr. A. D. Hardy, F.L.S., said that he could not understand the errors attributed to Mr. Walter, as he had always been most painstaking when giving information to members of the Club, many of whom were deeply indebted to him for the naming of their plants, which in many cases was done by comparison with specimens from his (Mr. Walter's) herbarium named by the late Baron von Mueller.

Messrs. F. Pitcher and D. Best spoke in the same strain.

Mr. T. S. Hall, M.A., referred to the difficulties in the way of carrying out Prof. Ewart's proposal.

Prof. Ewart, in replying to the remarks, stated he was pleased the question had excited so much interest.

NATURAL HISTORY NOTE.

Dr. J. C. Kaufmann exhibited several bottles demonstrating the osmotic growth of copper sulphate in a solution of ferrocyanide of potash simulating cellular growth, and explained the apparent formations, some being filamentous and others leaf-like. Dr. Cook and Professor A. J. Ewart explained at some length the chemical changes and the nature of the growth.

EXHIBITS.

By Mr. C. F. Cole.—A specimen of the common Native Cat, *Dasyurus viverrinus*, Shaw, caught at Auburn, 7/7/07.

By Mr. H. T. Coles.—Mounted specimen of Black Falcon (male), *Falco subniger*, Gray, from Horsham.

By Mr. F. Pitcher, on behalf of the Director Botanic Gardens. —Flowering branches of the following Acacias now in bloom in Melbourne Botanic Gardens:—*Acacia baileyana*, F. v. M., "Cootamundra Silver Wattle," from New South Wales: *A. discolor*, Willd., "Sunshine Wattle," Victoria, New South Wales, Tasmania; *A. podalyriæfolia*, A. Cunn., var. *viridis*, "Green-leaved Mt. Morgan Acacia," Queensland; *A. spectabilis*, A. Cunn., "Showy or Mudgee Acacia," New South Wales and Queensland; also dried specimens of *Bartsia trixago*, Linn., introduced from Europe and North Africa, collected at Broadmeadows, Nov., 1900.

After the usual conversazione the meeting terminated.

Elodea canadensis, Mich.—The expression "sap movements" in the notice of my exhibit in the June *Naturalist*, vol. xxiv., p. 20, is somewhat misleading. The movement of fluid exhibited in the cells of *Elodea canadensis* is quite distinct from any sap current, being really a rotation of the protoplasmic contents of the cell, and in each case is confined to the individual cell, and does not extend beyond it—*i.e.*, from one cell to another. —J. Stickland.

Osmotic Growth.—An interesting experiment, demonstrating an apparently natural growth in a chemical solution, was shown by Dr. J. C. Kaufmann at the last meeting of the Field Naturalists' Club. A solution is prepared by dissolving 1 dram of ferrocyanide of potash and 3 drams of nitrate of potash in 8 ounces of water. Into this is then introduced sulphate of copper, made up into globular masses about as large as an ordinary pea, with sugar of milk, in the proportion of one part of copper sulphate to two of sugar of milk. In a short time a chemical change takes place, and osmotic growth resembling cellular plant-like forms results. The growth assumes a variety of forms, and if one part of gelatine be added to the solution, sufficient support is given to the growth to render it permanent for some time.

THE ANIMAL-LIFE OF THE SUNBURY DISTRICT SIXTY YEARS AGO.

By Isaac Batey.

(Communicated by A. G. Campbell.)

(*Read before the Field Naturalists' Club of Victoria, 8th July*, 1907.)

Sunbury, from its proximity to Melbourne, little more than twenty miles in a direct line north-west, was one of the earliest districts to be settled when pastoralists began to spread out from the infant settlement of Port Phillip in the thirties. The surrounding country consists chiefly of basaltic plains, lying at an elevation of about 750 feet above sea level, but rising quickly beyond to 1,200–1,500 feet. Here and there are old worn-down volcanic hills, while several deep creek valleys, the principal of which is that of Jackson's Creek, help to diversify the scene.

In the early days the principal timber trees were Sheoaks (Casuarinas), but these, owing to the progress of settlement, have almost disappeared, though in the creek valleys some Red Gums, *Eucalyptus rostrata*, and a few other bushes, such as Hymenanthera and Bursaria, too small for firewood, still remain. The country was early devoted to sheep, and, as a consequence, the first settlers left no stone unturned to rid themselves of those native animals which were detrimental to pastoral pursuits ; hence the extermination of the Dingoes or Native Dogs was soon taken in hand, on account of the damage they wrought among the sheep. Other native animals were frightened away by the trampling of the flocks and herds, and on the outbreak of the Bendigo and Forest Creek diggings, in 1851–4, the principal route to which lay through the Sunbury district, the enormous traffic along the Mount Alexander road seemed to complete the disappearance of many native animals we had been accustomed to meet with in our rambles.

The centre of the area, comprising some 15,000 acres, with which I propose to deal in the following notes was in the olden days known as the Red Stone Hill station, situated between Jackson's and Emu Creeks, about 4 miles south-east of Sunbury railway station, the junction of the Sunbury, Lancefield, and Melbourne roads being about the centre of the old station. Glencoe station, occupied by the Messrs. Page, was opposite to us, on the south side of Jackson's Creek, while Brodie's Forest comprised the southern portion of the area between the Emu and Deep Creeks, bounded by Wildwood on the north. To the north of us was Jackson's Koorakoorakup station, now included in Sir R. Clarke's Rupertswood estate.

I will take the mammals in their natural sequence, and briefly refer to those with which we were more or less familiar.

The Orange-bellied Water-Rat, *Hydromys chrysogaster*,

Geoff.—After our arrival in 1846, it was many years before we noticed Water-Rats on Jackson's Creek, and, as we used to fish early and late whenever we had an opportunity, they must have been scarce. However, they afterwards became very plentiful, for a friend trapped no less than twelve dozen in a comparatively short time. It is easily captured with a fish-baited rabbit trap, set close to the water.

The Dingo, *Canis dingo*, Blumenb.—The Messrs. Page, pioneers of 1836, stated Dingoes or Native Dogs were the greatest trouble they had to contend with on their arrival in the district, and they destroyed many of them with set guns In 1846 there were still enough of them about to cause annoyance to flockmasters. My father recounted a day with the hounds in 1848 when two were killed in Brodie's Forest, between Emu and Deep Creeks, about four miles from our homestead. In 1849 my father claimed to have killed the last Dingo in our vicinity with a poisoned bait. One peculiarity of Native Dogs is the proneness to follow a horseman or vehicle. Such an instance occurred to me in 1847, near the present township of Bulla.

The Brush-tailed Phascologale, *Phascologale penicillata*, Shaw.—This handsome little animal, so remarkable for its activity, was rare, even in 1846, on Red Stone Hill and Glencoe, and it cannot be less than fifty years since the last was noted in those localities. In 1882 one was seen near Lancefield, and another, some years after, on the Dividing Range, towards Newham. In each case the animals had ensconced themselves in buildings, between the rafters and the roof.

The Pouched-Mice.—We had two kinds—the Thick-tailed, *Sminthopsis crassicaudata*, Gld., and the Brown, *Phascologale swainsoni*, Waterh. The latter was very rare, only one having been captured by a shepherd. The Thick-tailed Pouched-Mouse was met with as far back as I can remember. They were often found on turning over a heap of loose stones. Both kinds had handsome, fox-like heads.

The Common Dasyure or Native Cat, *Dasyurus viverrinus*, Shaw.—In 1846 this animal was very numerous, but later at various intervals they seemed to be infested with a burrowing maggot which brought them almost to the verge of extinction, and it was some time before they again regained their numerical strength, but I do not think the attacks of this parasite would alone have sufficed to complete their extinction. As boys we waged incessant war against Native Cats, and more especially when their skins became valuable. Later on, when rabbits became plentiful, and had to be trapped, many Native Cats were caught in the traps. Up to 1875 they were fairly numerous on what was our old station, but for the last twenty years I have not seen one about their old haunts. In 1883 a Tiger Cat, *D.*

maculatus, Kerr, was taken in a rabbit trap. This creature had always been a rare animal our way, and we surmised it came from the scrubby country to the north of Sunbury. The black Native Cat is a freak or sport, as I have taken a family of young containing both black and grey specimens, the mother being grey. From my experience I fancy the proportion of black to grey Native Cats is about 15 per cent. The pouch of the Dasyure is quite open, and the young appear to be attached to the teats for a certain time; how long cannot be stated. Then, evidently when too heavy to be carried, the mother deposits them in a grass nest concealed under loose stones, or in a hollow log or such-like. That the Native Cat is a cannibal we proved in our boyhood days.

The Short-tailed Bandicoot, *Perameles*, sp.—This animal was not plentiful in 1846, and later became rarer still; however, twenty years later, it again became numerous with us. In 1883 a nest of young was found, since which I have not noticed it.

The Koala or Native Bear, *Phascolarctus cinereus*, Goldf. —With us the Native Bear was a rarity, but in the early sixties a specimen was taken, while others visited us at intervals. In 1869, when on a visit to Mt. William, near Lancefield, 25 miles further north, I found them very plentiful. Judging by our observations, Native Bears seem to have the habit of travelling by night across the plains, from one range to another, for we would sometimes find them in the morning on a post, or the roof of an abandoned building.

The Common Opossum, *Trichosuris vulpecula*, Kerr.— Owing probably to the visits of the aboriginals, this animal was not plentiful in the early days, but when they ceased to visit the district, about 1851, Opossums became numerous. Later, when the demand for their skins set in, they became nearly extinct. Of late years they have again increased, but, unfortunately, they get caught in the rabbit traps. On parts of Red Rock station they are, I learn, rather plentiful.

The Ring-tailed Opossum, *Pseudochirus peregrinus*, Bodd.— This animal was never plentiful, but is still to be found along Jackson's Creek.

The Flying Phalanger or Flying Squirrel, *Petaurus breviceps*, Waterh.—The only specimen I remember was brought in by the cat one day, and by old residents was called the "Sugar Squirrel."

The Great Brush Squirrel, *Petaurus taguanoides*, Desm.— Never very plentiful; some 12 years ago I found one drowned in a large dam at Newham. They were more common in the Macedon region, further north, than with us. Mr. W. Thom told me of two albinos he had seen at Bullengarook.

The Wombat, *Phascolomys mitchelli*, Owen.—This animal

still exists in the Macedon region, where I have frequently seen their burrows, but never met the animal itself. On examining and skinning a dead one I was surprised to find it possessed a rudimentary tail similar to that of a Koala.

Kangaroos and Wallabies.—To list the animals of any district in Victoria without a reference to the members of the great genus Macropus would seem strange, but the fact remains that in 1846 and later Kangaroos and Wallabies were never seen in the area I am speaking of, the reason probably being that owing to the open nature of the country they were easily frightened or driven away by the first settlers in the district, in 1836. However, further to the north-west and north, in the timbered country about Bullengarook and Macedon, occasional specimens are still to be met with. I have been informed that the disappearance of Wallabies is largely due to their having become victims to that dreaded scourge of the sheep-farmer, fluke.

The Platypus, *Ornithorhynchus anatinus*, Shaw.—This singular mammal is still to be found on Jackson's Creek, principally on that part adjacent to Glencoe, Red Stone Hill, and the old Koorakoorakup station, portion of which is now occupied by the township of Sunbury. Though the Melbourne side has been settled for some seventy years, that section of the creek is not nearly so bare of these curious creatures as one would expect. In former times, though a Platypus saw you before taking his dive, if you waited quietly he would rise again not many feet from where the downward plunge was taken. Now they seem to have learned the habits of man, and once down they retire into their burrows. It seems to me this strategy accounts for their survival on Jackson's Creek, for had it not become alive to the sense of danger by this time it would have become extinct. With regard to it, and birds also, the law should step in. A gun license is required, though to render it thoroughly effective landholders should be penalized for allowing persons to shoot over their holdings without permission.

Fish.—The Blackfish, *Gadopsis marmoratus*, Rich., was at one time plentiful in our portion of the creek, and I once secured a specimen weighing 2 lbs.

In early years the creek was alive with Minnows (Galaxias, sp.), and I remember three of us as boys taking twenty dozen in one day with a cotton line and bent pin. Since the introduction of trout and perch the Minnow has decreased, still there are odd years when it is fairly plentiful.

The fish known to us as the "Pute" was a very handsome little fish, shaped like a carp, about two inches long, some with bright yellow on under parts, others brown throughout, the fins and tail red, mouth very small; scales, for size of fish, large. They used

to be found under partially submerged logs, but have now disappeared from the creek. Some years ago I took several in the Five-mile Creek, near the Hanging Rock, in the Woodend district.

The Freshwater Herring or Grayling, *Prototroctes maræna*, Gunther, was occasionally taken in the olden days. It is an exquisite little fish, semi-transparent, with a silvery belly. Mr. W. Bowie informed me that years ago he used to make fine hauls of them in the Yarra near Studley Park, and that they possessed the smell of cucumbers. Some twelve years ago, when fishing in the Deep Creek, under the Cobaw Ranges, not far from Lancefield, I took a few specimens of this fish, and found they possessed the odour mentioned. The individuals we caught seldom exceeded a length of four inches, but on one occasion I caught a solitary specimen which measured fully six inches. I have been told that they used to be taken lower down the creek, at Keilor, at one time.

I might mention here that Jackson's Creek, from 1846 to 1852, ceased to run every year from end of December or early in January until the autumn rains about April, but one season it remained a chain of waterholes until August. Since 1852 the cessation of flow has been very rare, though a few years back it stopped running for a few weeks. When the creek started again the inflow of fresh water into the stagnant pools caused some destruction of Blackfish. We used to find them moping in the shallows, more or less covered with a fluffy white fungus, which also occurred on any dead ones.

Another fish occasionally caught in Jackson's Creek was the Tupong or Black Flathead, *Pseudaphritis urvillii*, Cuv. and Val. Below our dwelling was a pool of good depth and some 100 paces long. Throughout a long stoppage of the creek four flocks of sheep were daily watered at this hole, consequently it at last became so low that the Messrs. Page bailed it out for the sake of the fish. Among those obtained was one of these Black Flatheads. During our many fishing excursions we had at odd times landed small specimens of this fish, especially when the evenings were cold and windy; such an event was always taken as a hint to roll up our lines, for we seldom secured any other fish afterwards.

Both silver and yellow-bellied eels were numerous; the heaviest I ever captured weighed 4½ lbs. The Lamprey has occasionally been taken, more often after the creek had ceased running for a time.

Reptiles.—Black Snakes, *Pseudechis porphyriacus*, were never plentiful, and seem now to have become extinct. Brown Snakes, *Diemenia textilis*, are still common, but are often mistaken for the Tiger Snake, *Notechis scutatus*. One season long ago we killed thirty-seven of these reptiles.

Of lizards we had several varieties. The rough-scaled Rock Lizard frequents stone walls ; the Blue-tongued, *Tiliqua scincoides*, White, was once rare, but seems to have increased of late years ; the so-called Bloodsucker, *Amphibolurus muricatus*, White, can still be met with. A waterside lizard was once very common along the creek, and fairly tame ; if bread crumbs were thrown down it would come and feed on them. On Redstone Hill, near the creek, is a patch of dusty ground which does not absorb moisture freely. This area has a quantity of sandstone (? Silurian, Ed.) blocks about it. Under some of them are to be found an elegant little lizard, with a very pale red tail. This lizard seems to be nocturnal in its habits, for in all my long experience I have never seen it abroad in daylight.

Finally, let me say a word about the aboriginals who used to live about Glencoe and Red Stone Hill stations. Mr. Richard Brodie, a pioneer of 1836, informed me that their favourite camping ground was known as "Native Point," and was at the junction of the Emu and Deep Creeks, a few miles above the present village of Bulla. Their last visit to our locality was about 1851, when four lubras, with an infant, came to wait for the brother of one of them to escort them to another part of the country.

A Curious Magpie's Nest.—Another magpie's nest built of wire is reported from the Horsham district. It was found in a fallen tree, and was composed of all kinds of wire—copper, short pieces of barbed wire, and even strips of wire netting. The nest was of the usual shape, over a foot deep, and about 3 lbs. in weight.—*Argus*, 28/6/07.

"Our Boys and Girls" is the title of a new publication intended for the boys and girls of our schools. It is issued monthly, at the remarkably low price of 1d. per copy, with the object, it is stated, of "creating a live interest in school work, and to bring the children into closer touch with each other. If children think, observe, and give expression to their thoughts, geography, natural history, composition, &c., should receive an impetus." A prominent feature in each number issued (that for July being the fifth) is a column headed "Monthly Records," in which is given dates of flowering of plants, appearance of insects, nesting of birds, &c., which in course of time should form a very valuable record. It is edited by Mr. James Lindsay, of Heywood, who will be pleased to forward it post free for twelve months on receipt of eighteenpence. This is certainly not an extravagent expenditure, and we trust many of our junior members will become subscribers, for we feel sure they cannot fail to derive some benefit from its monthly budget of interesting items, and possibly may become contributors themselves.

BIRD-LIFE IN THE NAGAMBIE DISTRICT.

By C. F. Cole.

(*Read before the Field Naturalists' Club of Victoria, 8th July*, 1907.)

Nagambie, from its situation on the banks of the so-called lake of the same name, is an ideal spot in which to study bird-life, and the following notes of a visit paid to the district in March last may be of interest to those who have not visited that part of Victoria.

The town, some 78 miles from Melbourne, is usually regarded as belonging to the north-eastern portion of Victoria, but an examination of the map will show that it is nearly due north of Melbourne, and really almost in the centre of the State.

A few words about Lake Nagambie are necessary in order that you may understand the characteristics of the district. The so-called lake is the result of the erection for irrigation purposes of the great weir across the Goulburn River at Wahring, some six miles lower down the stream, and the consequent damming back of the water, the elevation of the level of the water resulting in the overflow of the stream at several places, and the permanent filling up of the lagoons and backwaters along its course for a distance of some ten miles.

Near Nagambie this overflow takes the shape of a semi-circular lake, dotted with several small islands, with here and there stretches of mud-banks, and much used by the townspeople for pleasure purposes. The more distant backwaters form splendid feeding and breeding grounds for thousands of wild-fowl of many varieties.

My object in visiting the district was to note the different species of birds inhabiting these waters and the adjacent country. Accordingly, accompanied by a friend, I left town on 2nd March last, and, after a somewhat tedious train journey, we duly reached our destination, where steps were taken to hire a boat and procure sufficient provisions to last us for a camp-out of about a week.

We secured a strong, round-bottomed boat and started off down the river. After about twenty minutes' rowing, a small mud-bank came in sight, with numerous birds on it. Rowing quietly, we got near enough to recognize the White Ibis, the White-necked Heron, the White-fronted Heron, and the White-eyed Duck, also known as the Widgeon or Hard-head.

Before leaving this portion of the lake we observed specimens of the Musk Duck, Little Cormorant, Little Black Cormorant, Tippet Grebe, Black-throated Grebe, and Black Swan. This graceful bird was not nearly so plentiful this year as when I visited the district twelve months before.

We now entered a narrow stretch of backwater, which joined

the river about a mile lower down, thus saving a good half-hour's rowing. This portion required very careful steering, owing to the numbers of submerged stumps of trees and fallen timber. Feeding along the margin of the water were numerous Blue Bald-Coots, while large flocks of Coots were seen and met with right along to our camping ground. These birds, when rising off the water, have a peculiar habit of half-running, half-flying along the surface for some considerable distance. When they rise in any quantity, the noise of their laterally-lobed toes striking the water resembles the sound made by a small paddle-boat when in motion; while on the wing, their flight greatly resembles that of the Black Duck, which hereabouts was fairly plentiful.

We now entered the river proper, and, before reaching the place we had determined on for our camp, recognized the following species:—Tree-Martin, Wood-Swallow, White-rumped Wood-Swallow, Azure Kingfisher, Sacred Kingfisher, Brown Kingfisher or Laughing Jackass, White-rumped Swift, White-fronted Falcon, Brown Hawk, Brown Tree-creeper, Red-backed Parrakeet, and Yellow-bellied Shrike-Tit.

After about two hours' rowing we reached a suitable place for camping, and, selecting a spot well sheltered by saplings, it was not long before the tent was pitched, bunks put up, and everything made ship-shape. As a couple of hours of daylight yet remained we got out our fishing tackle, and had some good sport, securing Murray Cod, *Oligorus macquariensis*; Catfish, *Copidoglanus tandanus*, and Black Bream, *Therapon*, sp. Pulling back to camp, it was not long before the frying-pan and billy were set to work, and our evening meal prepared, for which we were quite ready.

We retired early, but only to be tormented by myriads of mosquitoes, which were only kept at bay by frequent use of cigar smoke and oil of lavender. During the night we were frequently disturbed by the cries of numerous night birds, among which we recognized the long-drawn-out cry of the Southern Stone-Plover as being greatly in evidence, as also that of the Spur-winged Plover, and the harsh, guttural note of the Night-Heron. Towards morning the well-known call of a Boobook Owl close to the tent greatly annoyed my dog, who no doubt, feeling hungry, mistook the call—mopoke—for *more-pork*. Next morning the owl was seen roosting in a thick-foliaged sapling not far away.

Rising at daybreak, after breakfasting we rowed across the back-waters to a large peninsula-shaped piece of land, thickly studded with Red Gum saplings, *Eucalyptus rostrata*, interspersed with Silver Wattles, *Acacia dealbata*, and plenty of rushes and reeds of different species. Here we came across the roosting-place of the Night-Heron, with plumed and unplumed birds in great numbers, no less than twenty-three being counted in one tree. As day-

light advanced the birds could be seen coming to roost among the saplings in scores. The Yellow-billed Spoonbill, and that graceful bird the White Egret, were flushed, but the latter was out of plumage.

Excursions were taken every day in different directions, and many additional birds met with, such as the Black Moor-Hen, the Darter, Teal, and the Black Cormorant; while on the hills close at hand were seen the White-winged Chough, the Babbler, the White-browed Babbler, the White-fronted Chat, the Black-faced Cuckoo-Shrike, White-plumed and Short-billed Honey-eaters, Brown Quail, White Cockatoo, Rosella Parrakeet, Cockatoo-Parrakeet, Purple-crowned Lorikeet, Musk Lorikeet, Little Lorikeet, Black and White Fantail, Spotted Pardalote, Magpie-Lark, Crow, Kestrel, Black-backed Magpie, Whistling Eagle, Reed-Warbler, and House-Swallow.

One day (7th March) about noon a large flock of the beautiful little Bee-eaters made their appearance at the camp, apparently collecting together after their breeding season preparatory to moving north, for next morning not a single bird was to be seen or heard.

Every evening scores of Tree-Martins came to roost amongst a large patch of Bulrushes, *Typha angustifolia*, opposite the camp, and an examination of the patch showed it to have been been used for that purpose for some time. As these birds in the day time are generally seen flying very high, or inhabiting the higher tree-tops, the selection of these bulrushes, where they perch side by side on the horizontally bent down stems, seems a remarkable proceeding.

In the adjacent paddocks large flocks of the Straw-necked Ibis were to be seen feeding on the numerous grasshoppers, and thus indicating their usefulness to the farmer or grazier. We were fortunate enough to see several specimens of that singular mammal, the Platypus, *Ornithorhynchus anatinus*, in the quieter portions of the stream. During the outing three species of snakes were seen and despatched—viz., the Brown Snake, *Diemenia textilis*, the Black Snake, *Pseudechis porphyriacus*, and the Tiger Snake, *Notechis scutatus*.

On the last morning of our camp we added four more birds to our list—the Bittern, the Pectoral Rail, and the Black-fronted Dottrel—while shortly before breaking-up camp a Wedge-tailed Eagle was seen circling high overhead.

Owing to the duck season being open, many of the birds were very shy, and at times it took a lot of strategy to get near enough to identify them. Sometimes we had to wade a considerable distance through the water, while at other times it was necessary to crawl through thistles or long grass.

Our camp came to an end on Saturday afternoon, 9th March,

and on our return journey nothing new was noticed until we reached the lake, where a pair of Pelicans was noticed perched in one of the highest of the dead trees. A close observer of bird-life living near the river informed me that this bird is one of the greatest enemies young ducks have, for, following them among the rushes, it is capable of scooping up a whole brood of ducklings in its large, distensible gular pouch. After a hard pull against a strong-head wind the boat-shed was again reached, thus ending a very enjoyable trip, the only mishap during the outing being caused by an erratic cow, which charged our tent one day during our absence and played sad havoc with it, tearing the front portion to ribbons.

Altogether sixty-seven species of birds were seen and recognized, in addition to many other objects interesting to the naturalist.

The following is a complete list of the birds noted :—

Wedge-tailed Eagle	Uroaëtus audax, Lath.
Whistling Eagle	Haliastur sphenurus, Vig.
Little Falcon	Falco lunulatus, Lath.
Brown Hawk	Hieracidea orientalis, Schl.
Kestrel	Cerchneis cenchroides, Vig. and Hors.
Boobook Owl	Ninox boobook, Lath.
Crow	Corvus coronoides, Vig. and Hors.
White-winged Chough	Corcorax melanorhamphus, Vieill.
Grey Shrike-Thrush	Collyriocincla harmonica, Lath.
Magpie-Lark	Grallina picata, Lath.
Black-faced Cuckoo-Shrike ...	Graucalus melanops, Lath.
Black and White Fantail	Rhipidura tricolor, Vieill.
White-fronted Chat	Ephthianura albifrons, J. and S.
Babbler	Pomatorhinus temporalis, V. and H.
White-browed Babbler	P. superciliosus, Vig. and Hors.
Black-backed Magpie	Gymnorhina tibicen, Lath.
Reed-Warbler	Acrocephalus australis, Gld.
Yellow-bellied Shrike-Tit	Falcunculus frontatus, Lath.
Brown Tree-creeper	Climacteris scandens, Temm.
Brown-headed (Short-billed) Honey-eater	Melithreptus brevirostris, V. and H.
White-plumed Honey-eater ...	Ptilotis penicillata, Gld.
White-rumped Swift	Micropus pacificus, Lath.
Bee-eater	Merops ornatus, Lath.
Azure Kingfisher	Alcyone azurea, Lath.
Brown Kingfisher (Laughing Jackass)	Dacelo gigas, Bodd.
Sacred Kingfisher	Halcyon sanctus, Vig. and Hors.
Spotted Pardalote	Pardalotus punctatus, Temm.
House-Swallow	Hirundo neoxena, Gld.
Tree-Martin	Petrochelidon nigricans, Vieill.
White-rumped Wood-Swallow ...	Artamus leucogaster, Valen.
Wood-Swallow	A. sordidus, Lath.
Musk Lorikeet	Glossopsittacus concinnus, Shaw
Purple-crowned Lorikeet	G. porphyrocephalus, Diet.
Little Lorikeet	G. pusillus, Shaw
White Cockatoo	Cacatua galerita, Lath.
Cockatoo-Parrakeet	Calopsittacus novæ-hollandiæ, Gmel.
Rosella Parrakeet	Platycercus eximius, Shaw

Red-backed Parrakeet	Psephotus hæmatonotus, Gld.
Brown Quail	Synœcus australis, Temm.
Pectoral Rail	Hypotænidia philippinensis, Linn.
Black Moor-Hen	Gallinula tenebrosa, Gld.
Blue Bald-Coot	Porphyrio bellus, Gld.
Coot	Fulica australis, Gld.
Southern Stone-Plover	Burhinus grallarius, Lath.
Spur-winged Plover	Lobivanellus lobatus, Lath.
Black-fronted Dottrel	Ægialitis melanops, Vieill.
White Ibis	Ibis molucca, Cuv.
Straw-necked Ibis	Carphibis spinicollis, Jam.
Yellow-bellied Spoonbill	Platibis flavipes, Gld.
White Egret	Herodias timoriensis, Less.
White-fronted Heron	Notophoyx novæ-hollandiæ
White-necked Heron	N. pacifica, Lath.
Night Heron	Nycticorax caledonicus, Gmel.
Bittern	Botaurus pœciloptilus, Wagl.
Black Cormorant	Phalacrocorax carbo, Linn.
Little Black Cormorant	P. sulcirostris, Brandt
White-breasted Cormorant ...	P. gouldi, Salvd.
Little Cormorant	P. melanoleucus, Vieill.
Darter	Plotus novæ-hollandiæ, Gld.
Pelican	Pelecanus conspicillatus, Temm.
Black-throated Grebe	Podiceps novæ-hollandiæ, Steph.
Tippet Grebe	P. cristatus, Linn.
Black Swan	Chenopis atrata, Lath.
Black Duck	Anas superciliosa, Gmel.
Teal	Nettion castaneum, Eyton
White-eyed Duck (Widgeon) ...	Nyroca australis, Gld.
Musk Duck	Biziura lobata, Shaw.

Mosses.—A brief paper on this despised division of plant-life, from the pen of Mr. R. A. Bastow, appears in the Victorian *School Paper* for Classes V. and VI. for this month (August). It includes figures of several species, and we hope will arouse some interest in these lowly plants.

Western Australia.—The latest maps of this State show a "Native Fauna and Flora Reserve." It is a block about fifteen miles by twenty, containing some 160,000 acres, situated in the Darling Range, due east of Pinjarra, on the Bunbury railway, about 66 miles south of Perth.

"Records of the Canterbury (N.Z.) Museum."—The first part of a new publication under the above title is to hand, and is devoted to a "Basic List of the Fishes of New Zealand," by Mr. Edgar R. Waite, F.L.S., Curator of the Museum. The list is founded on the late Capt. Hutton's "Catalogue of the Fishes of New Zealand," but with additions and alterations according to the latest literature. The full reference is given to the description of each of the 252 species listed, but the arrangement differs considerably from that adopted by Mr. D. G. Stead for his "Fishes of Australia," recently published.

Nests and Eggs of Birds Found Breeding in Australia and Tasmania.—Another part of this Special Catalogue, issued by the Australian Museum, Sydney, being the second part of vol. ii., has been published. In it the author, Mr. A. J. North, C.M.Z.S., Ornithologist to the Museum, continues his descriptions of the nests and eggs of a number of families of Passerine birds. A large portion is devoted to those essentially Australian birds, the honey-eaters, the nests of many of them being figured in the text, while a full-page plate is devoted to the nest of Lewin's Honey-eater. Two plates of eggs are given, figuring 66 specimens, belonging to 51 species, which in the hand-coloured copies are exceedingly faithful representations. Though called a catalogue, the work is no mere record of species, for the divers notes and records which Mr. North has gathered together form most interesting reading.

Natural History in Brisbane.—We have received from Brisbane a report, in pamphlet form, of the first annual meeting of the Field Naturalists' Club, but what the full title of the society is the pamphlet does not indicate, so whether it should be referred to as the Brisbane or the Queensland Field Naturalists' Club we cannot say. It contains a brief statement of a successful year, and an interesting and poetical address by the retiring president, Professor S. B. J. Skertchley, in which he briefly touched on some of the difficulties encountered by such a society, and in calling attention to the rapidly disappearing fauna and flora, urged that a biological survey of the Brisbane district should be commenced ere it is too late. The indiscriminate felling of trees drew forth a scathing denunciation, while the solution of some of Nature's mysterious migration problems was held out as useful work to be done.

A Correction.—It has been the usual custom in the *Naturalist* to print all specific names as commencing with a small letter. The latest rules of botanical nomenclature, adopted at the 1905 congress, require all specific names derived from proper names to be commenced with a capital. This detail was overlooked in several instances in Prof. Ewart's papers on pages 12–14 and 56–60 of the current volume, and he desires to disclaim any intention of disregarding the rules as framed. Through a misreading of the proof the heading of the third paragraph on page 13 has been transposed—the portion in italics should be in small capitals, and *vice versâ*, as is shown by the concluding sentence of the paragraph, *Deyeuxia montana* being merely a variety of *D. quadriseta*, Benth.—Ed. *Victorian Naturalist.*

The Victorian Naturalist.

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FIELD NATURALISTS' CLUB OF VICTORIA.

A special general meeting was held in the Royal Society's Hall on Monday evening, 12th August, 1907, to consider a proposed addition to the rules.

The president, Mr. G. A. Keartland, occupied the chair, and about 100 members and visitors were present.

In accordance with his notice of motion given at the previous meeting, Professor A. J. Ewart moved—"That with regard to all plants exhibited at the Field Naturalists' Club meetings, or recorded in the *Victorian Naturalist*, as new to science, to the State or its districts, at least one specimen of each such plant shall become the property of the Field Naturalists' Club, and shall be deposited for reference either in the Club's rooms or in the National Herbarium, and that unless this condition be fulfilled no record shall be accepted for publication except by resolution of the committee for the time being."

In speaking to the motion, Prof. Ewart explained that in consequence of the publication in the *Victorian Naturalist* of inaccurate records of plants as new to science or to the State, considerable confusion had been created, to remedy which necessitated a great amount of time and labour being spent in searching through piles of specimens. He stated that in order to be of value to future workers, it was the duty of the Club to keep such records as accurate as possible. Great difficulty was often experienced in ascertaining their correctness, owing to the absence of specimens of the plants dealt with. It was most important that mistakes should be corrected without loss of time, and he thought that the adoption of the rule suggested would ensure the immediate correction of any errors which might be made. It was generally a very easy matter to obtain duplicate series of specimens, though, in the case of certain plants, such as orchids, there might at times be some little difficulty. He thought, however, that, should special cases arise, some way would be found by which the rule might still be observed.

Mr. G. Coghill seconded the motion.

Mr. F. G. A. Barnard thought that it was hardly fair to single out botanists, and that the proposed rule should apply to all branches of natural history. He moved—"That the matter be postponed for further consideration, so as to give the committee an opportunity of considering whether it should not apply to all branches of natural history."

Mr. A. D. Hardy seconded the amendment, and said that a

great many of the members were opposed to the motion, which, if adopted, might result in their work being published elsewhere. He suggested that one specimen of each plant exhibited or recorded be loaned for examination by the Herbarium authorities.

Mr. J. Shephard said he would be obliged to oppose the motion, which he thought far too stringent. The object of the Club had always been to encourage members to assist the cause of science, and any attempt to use compulsion, as suggested in the proposed rule, would be apt to do the Club harm. He agreed that it was very necessary for workers to be as accurate as possible, and suggested that some provision might be made by the committee to prevent as far as possible inaccurate records being published ; and he was also strongly opposed to the amendment.

Professor Ewart, in reply, said he quite expected that his suggestion would be subjected to criticism. His object was to endeavour to obtain, for the purpose of future reference, specimens of such plants as were exhibited and recorded in the Club's journal, and he thought that if such a rule had been adopted at an earlier date there would now be available a good collection for reference. In view of the inaccuracies in the past, the matter was becoming a very serious one to botanical workers. He did not think anything would be gained by further postponing the matter, and was quite ready to abide by the result. He desired to see the Club's journal retain its high plane of excellence, and he could see very little difficulty in carrying out the suggested rule.

Both the amendment and the motion were then put to the meeting and declared lost.

The business of the ordinary meeting was then proceeded with.

REPORTS.

A report of the Club's visit to the National Herbarium on Saturday, 13th July, was given by Mr. F. G. A. Barnard, who stated that there was a good attendance of members, and a very interesting and instructive afternoon was spent under the guidance of Professor Ewart. The arrangement of the Herbarium was pointed out, and the methods of working demonstrated, while an examination of some of the valuable botanical works in the library was made.

A report of the excursion to Blackburn on Saturday, 10th August, was given by the leader, Mr. G. Coghill, who stated about sixteen members attended. Although rather early in the season, several interesting plants were found in bloom, among them being *Styphelia serrulata*, notable for its peculiar greenish flowers.

Mr. T. S. Hall, M.A., stated that about 35 junior members attended the Biological Laboratory at the University on Saturday, 27th July, when Professor Baldwin Spencer, C.M.G., gave an

interesting lecture on "How Different Animals See." Three different types of eyes were dealt with—viz., the human eye, that of a limpet, and the compound eye of a fly. The lecture, which was illustrated by a series of diagrams, and some simple experiments were shown with the aid of a pin-hole camera, &c., was followed with keen interest by those present.

Mr. F. G. A. Barnard reported that the junior excursion to Sandringham on Saturday, 3rd August, was rather poorly attended, owing, probably, to the threatening afternoon. However, a ramble across the heath ground enabled those present to obtain some beautiful spikes of *Epacris impressa*, whilst a number of other interesting observations were made, and some larvæ obtained for rearing at home.

The hon. librarian reported the receipt of the following donations to the library :—*Journal of Agriculture of Victoria*, July, 1907, from the Department of Agriculture ; *Agricultural Gazette of New South Wales*, July, 1907, from Secretary for Mines and Agriculture, Sydney ; "Annals of the Queensland Museum, Brisbane, No. 7 : Occasional Notes," by C. W. De Vis, M.A., Director, from the Trustees ; *Nature Notes*, June, 1907, from the Selborne Society, London ; and *The Wilson Bulletin*, No. 58, March, 1907, from the Wilson Ornithological Club, U.S.A.

PAPERS.

1. By Mr. C. F. Cole, entitled "Some Birds of the Hawthorn District."

The author gave a few brief notes about birds he had observed in the district, and submitted a list of over sixty species observed during the first six months of the present year.

2. By Messrs. T. S. Hall, M.A., J. H. Harvey, and W. Thorn, entitled "Buchan and its Caves."

A very interesting description of a visit to the Buchan Caves in December last was given by Mr. Hall, who dealt chiefly with the geology and geography of the country from Bairnsdale to Buchan, together with the limestone country around Buchan in which these caves are situated. His remarks were illustrated by a very fine series of lantern views, particularly of the Buchan district. Mr. J. H. Harvey followed with a detailed description of some of the older known caves as they existed nearly twenty years ago, and showed a number of very interesting photographic views both of the caves and the surrounding country taken by him at that time. Mr. W. Thorn dealt principally with the more recently discovered caves, and particularly with the "Fairy Cave," now being opened up by the Government. An excellent series of views of this cave was shown, together with others from the Kitson Cave and the Murrindal River.

Each speaker was followed with keen interest, and the views exhibited were greatly admired.

Mr. J. Searle, hon. lanternist, showed, for purposes of comparison, a series of views of the Jenolan Caves, New South Wales.

EXHIBITS.

By Mr. J. W. Audas.—*Acacia verticillata*, Willd., type form; *Acacia verticillata*, var. *ovoidea*, Benth., collected at Frankston, 3/8/07. Exhibited on account of having been found growing in a prostrate form amongst grass, the type form of *A. verticillata* being bushy, tall, and erect.

By Mr. F. G. A. Barnard.—Growing fern, *Botrychium ternatum*. Original plant, collected 20 years ago at Oakleigh.

By Mr. C. F. Cole.—Mounted specimens of Dollar-bird, *Eurystomus australis*, Swains., from Kerrisdale, Goulburn River, Victoria.

Exhibited by Prof. A. J. Ewart, D.Sc., Ph.D., &c.—*Cassinia longifolia*, R. Br., wrongly determined as *C. lævis*, R. Br., and also wrongly recorded as new for Victoria in the *Vict. Nat.*, vol. x., p. 132 (1883); *Cassinia longifolia*, R. Br., type form; *Cassinia lævis*, R. Br., type form; *Cassinia aculeata*, R. Br., erroneously determined as *C. lævis*, R. Br., and recorded as new for the south of Victoria in *Vict. Nat.*, vol. x., p. 160 (1884); *Cassinia aculeata*, R. Br., type form. Distribution of *C. lævis*, R. Br., South Australia, New South Wales, and Queensland.

By Mr. C. French, jun.—Four species of Ant-nest Beetles—*Kershawia rugiceps*, Lea, n. sp.; *Nepharis alata*, Castel.; *Trilobium myrmecophilum*, Lea, n. sp.; *Dabra myrmecophilum*, Oliff., from the Mallee, collected by Messrs. J. C. Goudie and C. French, jun.

By Miss L. Horner.—Nest of Mistletoe-bird, *Dicæum hirundinaceum*, Shaw, from Doncaster.

By A. H. E. Mattingley.—Eggs of Plumed Egret, *Mesophoyx plumifera*, Gld., taken by him at Mathoura, N.S.W., 9/11/06. Previously unrecorded for Australia.

By Mr. F. Pitcher, on behalf of the Director Melbourne Botanic Gardens.—Blooms of the following acacias now flowering in the Gardens:—*Acacia cultriformis*, A. Cunn., Knife-leaved Acacia, New South Wales and Queensland; *A. elongata*, Sieber, Long-podded Acacia, Victoria, New South Wales, Queensland, Tasmania; *A. Jonesii*, F. v. M. and Maiden, Jones's Acacia, New South Wales; *A. juniperina*, Willd., Prickly Wattle, Victoria, New South Wales, Queensland, Tasmania; *A. leprosa*, Sieber, var. *elongata*, Seville Wattle, Victoria; *A. myrtifolia*, Willd., Myrtle-leaved Acacia, Australia and Tasmania; *A. strigosa*, Link., Hairy Acacia, Western Australia; *A. urophylla*, Benth., Tail-leaved Acacia, Western Australia.

By Mr. A. O. Thiele.—Specimens of Serpentine from Mt. Wellington.

By Mr. E. O. Thiele.—Native axes from Mt. Wellington district.

By Mr. J. R. Tovey.—*Pterostylis concinna* x *reflexa*, var. *intermedia*. A hybrid orchid collected at Mentone, July, 1907, growing among *Pterostylis concinna*, R. Br., and *P. reflexa*, R. Br., var. *intermedia*, A. J. Ewart. Vegetatively it somewhat resembles the latter species, but the labellum is broader and faintly but distinctly bifid at its apex, in this respect approaching *P. concinna*, R. Br. *Pterostylis concinna*, R. Brown, type form. ; *Pterostylis reflexa*, R. Br., var. *intermedia*, A. J. Ewart, n. var., in Proc. Roy. Soc. of Vict., 1907, type form.

By Mr. J. Wilcox.—A protozoan, *Dinobryon*, sp., most probably *D. sertularia*.

After the usual conversazione the meeting terminated.

Popular Names for Native Plants.—Following up the suggestion made in a paper read before the Field Naturalists' Club some little time ago, a sub-committee has been appointed to see what can be done towards compiling a list of popular names for our commoner native plants. The first step is, of course, to get as many lists of names as possible from observers in various parts of the State, and with that view the sub-committee requests all interested, especially teachers, who, perhaps, have better opportunities than others, to forward any names they may know of to Dr. C. S. Sutton, Rathdown-street, North Carlton, who has kindly consented to act as secretary to the movement. It is not to be expected that this work will be accomplished in one season, but, if started at once, it will not be long before a satisfactory foundation can be laid for future work, which, it is hoped, will include the publication of a Floral Calendar for the State. Parcels of dried specimens, with local names attached, may be forwarded to the care of Mr. J. A. Leach, M.Sc., Training College, Carlton.

Effects of Tree Planting.—"F. R.," in an interesting article in the *Australasian* of 3rd August, 1907, points out how the western plains of Victoria, which were formerly treeless, and consequently almost destitute of bird-life, at any rate of the smaller species, have, by the judicious planting of many miles of shelter-belts on the various estates, become almost wooded country. Many of these trees, principally gums and wattles, are now 40 feet high, and afford nesting-places for various birds never seen in the district before, such as Honey-eaters, Wattle-birds, Yellow-rumped Tits, Grallinas, and Noisy Minahs. In the middle of June dozens of Scarlet-breasted Robins were to be seen about Lismore. Magpies, Parrots, and Parrakeets have also found out the plantations.

ON SUPPOSED NEW VICTORIAN PLANT RECORDS.

By Alfred J. Ewart, D.Sc., Ph.D., F.L.S., Govt. Bot.

(*Read before the Field Naturalists' Club of Victoria, 8th July*, 1907.)

After the death of Baron Mueller, in 1896, a great lack of co-ordination became evident in regard to botanical effort in Victoria, different workers appearing to have proceeded independently, without any regard to one another, and with still less towards the National Herbarium. It is pleasing to be able to record that a new spirit of scientific co-operation appears to be rising among those interested in botanical study in this State, and that the National Herbarium takes its proper place in this movement as a centre of reference, subsidized by Government for the general good and for the use of all.

Unfortunately, a certain aftermath of the previous confusion remains to be swept away, and it is the purpose of this note to draw attention to one of the more striking but not the only instance of inaccurate recording during the period mentioned. It should be clearly understood that in drawing attention to an inaccurate record of this period no reflection is intended upon its author, but simply upon the system, or rather lack of system, which gave rise to it. I wish also to emphasize the fact that unless records are tested at the Herbarium continual confusion is apt to be created, and to suggest as a remedy that in the case of all plants exhibited at the Field Naturalists' Club, and recorded as new to science, to the State, or to its districts, one specimen of each such plant shall become the property of the Field Naturalists' Club, and shall either be retained for reference by the club or deposited in the National Herbarium. A mistake made in such fashion that it can be corrected and is corrected becomes of small account, but a statement that can be neither verified nor disproved is a serious obstacle to scientific progress.

The particular list to which I refer is one by Mr. C. Walter in the *Victorian Naturalist*, vol. xvi., 1899, p. 99, which purports to give a list of "twenty-five species unrecorded for Victoria, and seventy-four with additional regional records." Mr. Tovey, my Herbarium assistant, drew my attention to the fact that some of the former could not possibly have been new records, and on investigating the matter it appears that the whole of the plants had been previously recorded, with four exceptions, one of which appears to be founded on incorrect naming, and that, since we have no exact details of the date, locality, and collector of two out of the remaining three, practically the whole of this part of the list becomes valueless, although its compilation must have entailed a good deal of trouble to its author. The detailed list of supposed new species is given below, with the data compiled by Mr. Tovey and myself, and in regard to the list of new districts the Herbarium cannot *officially* recognize any new record in the absence of some tangible evidence of its validity.

The following are the species recorded in the list referred to :—

Eriostemon umbellatus, Turcz. Recorded in second edition of "Census of Australian Plants," 1889, as Victorian.

Indigofera efoliata, F. v. M. No specimen or record in the Herbarium.

Acacia glanduligicarpa, Reader. Recorded by Reader in the *Vict. Nat.*, vol. xiii. (1897), p. 146 (original description).

Tillæa pedicellosa, F. v. M. Recorded by Baron von Mueller in the *Vict. Nat.*, vol. x. (1894), p. 187, as Victorian.

Leptospermum myrtifolium, Sieb. In "Census," 1889, as Victorian.

Eucalyptus corymbosa, Sm. In "Census," 1889, as Victorian.

Erigeron minurioides, Benth. In Benth. Fl. Aust., vol. iii., p. 495 (1866), and "Census," 1889, as Victorian.

Helichrysum Backhousii, F. v. M. In "Census," 1889, as Victorian.

Helichrysum diotophyllum, F. v. M. Recorded by F. v. Mueller in the *Vict. Nat.*, vol. x. (1894), p. 187, as Victorian.

Calocephalus (Leucophyta) Lessingii, F. v. M. This specific name was proposed by Mueller for C. citreus, Less., and C. lacteus, Less., combined (see *Vict. Nat.*, vol. ix, p. 187). Both species are recorded in the "Key" (1887–8) and "Census," 1889, as from Victoria. C. lacteus is also given in Benth. Fl. Aust., vol. iii., as Victorian.

Senecio D'altoni, F. v. M. No specimen or record in the Herbarium.

Erechtites picridioides, Turcz. In "Census," 1889, as Victorian.

Epacris mucronulata, R. Br. No Victorian specimen in the Herbarium. A specimen of this name by Weindorfer (1904), from Mt. Erica, proved to be E. heteronema, Labill., var. planifolia, already recorded in Benth. Flora for elevations up to 4,000 feet. A specimen from C. Walter (Vict. Alps, Jan., 1898) proved to be E. paludosa, R. Br., exactly matching type specimens of that species.

Calochilus campester, R. Br. In "Census," 1889, as Victorian.

Prasophyllum brevilabre, J. Hook. In "Census," 1889, as Victorian.

Prasophyllum Reichenbachii, F. v. M. In "Census," 1889, as Victorian.

Caladenia testacea, R. Br. In Fl. Aust., Benth., vol. vi., p. 387 (1873), as Victorian.

Xanthorrhœa hastilis, F. v. M. In "Census," 1889, as Victorian.

Panicum parviflorum, R. Br. Evidently a mistake in identification. A specimen received in 1906 from Mr. Walter, labelled Panicum parviflorum, R. Br., proved to be Agrostis scabra, Willd. (Agrostis parviflorum, R. Br.)

Panicum trachyrachis, Benth. No Victorian specimen previously in the Herbarium, but a specimen from the Murray River

(Walter, 1904) resembles variety tenuior of P. trachyrachis more closely than it does the type specimens (glumes blunter and panicle less scabrous).

Danthonia setacea (F. v. M.?), R. Br. In Fl. Aust., vol. vii., p. 595 (1878), as Victorian.

Stipa scabra, Lindl. In Fl. Aust., vol. vii., p. 570 (1878), as Victorian ; also in "Census," 1889.

Stipa micrantha, Cav. In "Census," 1889, as Victorian.

Stipa acrociliata, Reader. Recorded by Reader in *Vict. Nat.*, vol. xiii. (1897), p. 167 (original description).

Lycopodium carolinianum, L. In "Census," 1889, as Victorian.

Kapiti Island, N.Z.—Through the courtesy of the editor of the *Chemist and Druggist*, Melbourne, we have received a copy of a report presented to the New Zealand Parliament of a much more interesting character than the usual style of Parliamentary papers. It is entitled "A Botanical Survey of Kapiti Island," and has been written by Dr. Cockayne, of Christchurch. Kapiti Island is situated in the northern portion of Cook's Strait, some thirty miles north-east of Wellington, and only about three miles from the shore of the North Island. It is one of the islands which the New Zealand Government has set aside as sanctuaries for plant and animal life, and, with the view of learning the characteristics of its flora, Dr. Cockayne was instructed by the Minister of Lands to undertake a botanical survey of it. He appears to have done his work very thoroughly, and the way he has put his observations together should form a model for future work of the kind. According to his report, the island seems, from its configuration, to have formed part of the land bridge which at one time connected the North and South Islands of New Zealand. It is only some 5,000 acres in extent, but its flora forms several marked associations, in consequence of the influence of soil, prevailing winds, and such like. Each is fully dealt with, and though the species are different from those to which we are accustomed, still it is easy to follow his remarks and apply his deductions to the vegetation of our own State. A number of excellent half-tone plates of characteristic features are included, as well as a large scale map. He gives his opinion as to what should be done to make the island a veritable natural botanical museum, and says that all animals foreign to the island must be got rid of, more especially the goats and cats, the former being, of course, inimical to the flora, while the latter are a serious menace to the bird-life, which in their absence would doubtless become even more interesting than it is at present. A list is given of some 250 endemic and 42 introduced plants. Copies of the report can be obtained from the Government Printer, Wellington, at a cost of one shilling.

SOME BIRDS OF THE HAWTHORN DISTRICT.

By C. F. Cole.

(*Read before the Field Naturalists' Club of Victoria, 12th August*, 1907.)

Towards the south-eastern corner of the city of Hawthorn, and just outside the five-mile radius from the General Post-Office, Melbourne, lies a block of some eighty-four acres of private property. A large portion of this up to within a short time ago was almost in in its natural state, being thickly timbered with gum saplings, mostly Red Gums, *Eucalyptus rostrata*, Schl., while here and there a Native Cherry-tree, *Exocarpos cupressiformis*, Labill., or a She-oak, *Casuarina quadrivalvis*, Labill., adds variety to the foliage. There still remain a number of the giant Red Gums for which Hawthorn was noted when first settled. These kings of the forest, long past their prime, are now gnarled and hollow, but if they could speak they could probably tell some exciting tales of the life led by the aboriginal inhabitants of the district, whose tomahawk marks they bear on their trunks, made by the dusky owners when in search of the much-beloved Opossum, *Trichosuris vulpecula*, Kerr, which provided both food and clothing. These animals were doubtless fairly numerous, and may yet be seen on a moonlight night as they roam among the leafy branches.

The hollows in the large trees were a few years back the breeding places of such native birds as the Brown Kingfisher or Laughing Jackass, the Sacred Kingfisher, the Boobook Owl, and the Owlet Nightjar, but now such introduced birds as the English Starlings and Sparrows or Indian Minahs have taken possession, and rear their young year after year unmolested.

Years ago one of the commonest birds of the district was the Lunulated Honey-eater, then more frequently called the Black-cap. The White-plumed Honey-eater was also fairly plentiful, and is so still, for as the Lunulated species disappeared so the White-plumed seemed to increase.

As a native of the district, and a close observer of bird-life from my boyhood days, I have noticed that the increase of introduced birds means the disappearance of the native species—purely, I take it, a matter of the survival of the fittest, for the introduced birds seem to be more prolific and to be able to adapt themselves to circumstances more readily than the indigenous species.

Some of our native birds seem to exhibit a tendency to roam about from one part of the country to another. After the first rains in autumn many species may be seen frequenting this natural shelter, and, singly, in pairs, or in flocks. apparently settling down for a short stay as they are passing by.

A short distance to the south lies the broad valley of Gardiner's Creek, frequented at times by several varieties of herons, especially the White-fronted ; this year I saw there for the first time the White-necked Heron.

It must not be understood that all the birds given in the following list are of everyday occurrence, for such is not the case. For instance, this year the Cockatoo-Parrakeet appeared in flocks for the first time. Amongst the autumn visitors every year is the pretty little bird known both as the Mistletoe-bird and the Swallow Dicæum, which arrives at that time of the year to feed on the Mistletoe berries, and in so doing and dropping the hard seeds on the branches of the trees is responsible for the spread of the Mistletoe, *Loranthus pendulus*, Sieb., which is fairly common among the saplings. The bird, however, does not breed here, and generally takes its departure about the month of August.

Among the birds which used generally to build in the locality every year were the Tawny-shouldered Podargus, Boobook Owl, Sacred Kingfisher, Brown Kingfisher or Laughing Jackass, Owlet Nightjar, Magpie-Lark, White-backed Magpie, Black and White Fantail, Restless Flycatcher, Silver-eye, Grey Shrike-Thrush, Rufous-breasted Thickhead, White-eyebrowed Wood-Swallow, Red Wattle-bird, Lunulated Honey-eater, Warty-faced Honey-eater, and White-plumed Honey-eater. The nest of the last-named bird was in great request by the Pallid Cuckoo for the depositing of its eggs, and on several occasions when a boy I have shot this cuckoo with a shanghai (catapult) when sitting on the honey-eater's nest, and have afterwards found the egg on dissection.

Regarding cuckoos I find the following notes in my diary :— "June 12/05.—Saw Fan-tailed Cuckoo." "July 7/05.—Saw Bronze Cuckoo." "Aug. 19/05.—Saw Pallid Cuckoo." This year, when at Beaconsfield, I heard the call of a Pallid Cuckoo on 21st July—a very early appearance.

At different times I have seen such birds here as the Sanguineous Honey-eater, Banksian Black Cockatoo, and Lesser White Goshawk, and among my stuffed specimens are examples of the Sanguineous Honey-eater and Silver Goshawk, both shot in this neighbourhood.

The following is a complete list of the birds (sixty-four species) observed here by me during the first six months of this year (1907) :—

Whistling Eagle	Haliastur sphenurus, Vig.
Little Falcon	Falco lunulatus, Lath.
Kestrel	Cerchneis cenchroides, Vig. and Hors.
Goshawk	Astur approximans, Vig. and Hors.
Boobook Owl	Ninox boobook, Lath.
Crow	Corvus coronoides, Vig. and Hors.
Oriole	Oriolus viridis, Lath.
Grey Shrike-Thrush	Collyriocincla harmonica, Lath.
Magpie-Lark	Gralina picata, Lath.
Black-faced Cuckoo-Shrike ...	Graucalus melanops, Lath.

White-fronted Chat	Ephthianura albifrons, J. and S.
Scarlet-breasted Robin	Petrœca leggii, Sharpe
Flame-breasted Robin	P. phœnicea, Gld.
Blue Wren	Malurus cyaneus, Ellis
White-shafted Fantail	Rhipidura albiscapa, Gld.
Rufous Fantail	R. rufifrons, Lath.
Black and White Fantail	R. tricolor, Vieill.
Restless Fly-catcher	Sisura inquieta, Lath.
Mountain-Thrush	Geocichla lunulata, Lath.
Striated Tit	Acanthiza lineata, Gld.
Yellow-rumped Tit	A. chrysorrhoa, Q. and Gaim.
Spotted Babbling-Thrush (Ground-Thrush)	Cinclosoma punctatum, Lath.
White-backed Magpie	Gymnorhina leuconota, Gld.
Butcher-bird	Cracticus destructor, Temm.
Yellow-bellied Shrike-Tit... ...	Falcunculus frontatus, Lath.
White-throated Thickhead ...	Pachycephala gutturalis, Lath.
Rufous-breasted Thickhead ...	P. rufiventris, Lath.
Spine-billed Honey-eater	Acanthorhynchus tenuirostris, Lath.
Silver-eye	Zosterops cœrulescens, Lath.
Brown-headed Honey-eater ...	Melithreptus brevirostris, V. and H.
Yellow-faced Honey-eater ...	Ptilotis chrysops, Lath.
White-plumed Honey-eater ...	P. penicillata, Gld.
Noisy Minah	Manorhina garrula, Lath.
Red Wattle-bird	Acanthochæra carunculata, Lath.
Spiny-cheeked Honey-eater ...	A. rufigularis, Gld.
Mistletoe-bird	Dicæum hirundinaceum, Shaw.
Striated Pardalote	Pardalotus ornatus, Temm.
Spotted Pardalote	P. punctatus, Temm.
Pipit (Ground-Lark)	Anthus australis, Vig. and Hors.
White-browed Wood-Swallow ...	Artamus superciliosus, Gld.
Wood-Swallow	A. sordidus, Lath.
Fire-tailed Finch	Zonæginthus bellus, Lath.
Tawny Frogmouth	Podargus strigoides, Lath.
Brown Kingfisher (Laughing Jackass)	Dacelo gigas, Bodd.
Sacred Kingfisher	Halcyon sanctus, Vig. and Hors.
Pallid Cuckoo	Cuculus pallidus, Lath.
Fan-tailed Cuckoo	Cacomantis flabelliformis, Lath.
Narrow-billed Bronze-Cuckoo ...	Chalcococcyx basalis, Hors.
Bronze-Cuckoo	C. plagosus, Lath.
Musk Lorikeet	Glossopsittacus concinnus, Shaw
Purple-crowned Lorikeet	G. porphyrocephalus, Diet.
Little Lorikeet	G. pusillus, Shaw
White Cockatoo	Cacatua galerita, Lath.
Rose-breasted Cockatoo	C. roseicapilla, Vieill.
Cockatoo-Parrakeet	Calopsittacus novæ-hollandiæ, Gmel.
Rosella Parrakeet	Platycercus eximius, Shaw
Swift Lorikeet	Nanodes discolor, Shaw
Bush Bronze-winged Pigeon ...	Phaps elegans, Temm.
Stubble Quail	Coturnix pectoralis, Gld.
Brown Quail	Synœcus australis, Temm.
Painted Quail	Turnix varia, Lath.
Pectoral Rail	Hypotænidia philippinensis, Linn.
White-fronted Heron	Notophoyx novæ-hollandiæ
White-necked Heron	N. pacifica, Lath.

Also the following introduced birds:—Starling, Sparrow, Greenfinch, Goldfinch, Skylark, Blackbird, and Thrush (England); Indian Minah, Javan Dove.

Bird-Life on Resolution Island, N.Z.—New Zealand has now set aside seven national parks in various parts of the main islands, aggregating in all some 4,330 square miles of country, the greatest of all being the one which embraces the West Coast Sounds, and contains no less than 3,600 square miles. Of this Resolution Island, lying between Dusky and Breakesea Sounds, forms a part, and in the sixth annual report of the Tourist and Health Resorts Department, just to hand, considerable space is given to the question of bird-life in the sanctuaries set apart for its protection. The caretaker on Resolution Island, one of these sanctuaries, is evidently an enthusiast, for he writes very fully on the birds of his island, and says on the whole the larger native birds are increasing, but the smaller ones are having a serious time at the hands of the blackbirds, sparrows, and thrushes. It seems that the smaller native birds were almost entirely honey and berry feeders, and that the introduced birds, besides living on worms, have adapted themselves to live on berries and honey also. He says a sparrow can go over a bunch of flowers of *Panax arboreum*, and extract all the honey as smartly as any native, consequently the latter has to starve. The Kakapos, or ground parrots, are also feeling the stress of competition, for they have to walk from one berry-bearing district to another, while the new berry-eaters fly, and gather up the whole crop before the rightful owners arrive, the consequence being the Kakapos have no opportunity to lay up that store of fat by which they used to tide over the winters in former years. The want of food is also telling on their breeding habits, and a season frequently goes by without any attempt at breeding, which can only result in their extermination at no distant date. Later on he says the sparrow will defeat all efforts to introduce pheasants and quail unless food in the shape of hundreds of pounds' worth of seed and grain be distributed annually. Another remark reads: —"Cascade Bush is full of Wood-hens, by the way they have the moss all pulled about, and yet I did not see one of them in the bush, though when there were only a few we used to see every one of them, for they would come to us, and in that same place. In the last three days they must have continually seen my dog, but in fear of a ferret kept out of sight. It is wonderful that they could make such a change in their manner in about one year. Yet it is a fact, for I left the dog aboard the boat, and then the Wood-hens on the beach were not afraid of me. But they could not bear the sight of the dog; his colour is suggestive of a ferret." Writing in January, he says he had returned from Wet Jacket, and found Kakapos there, but just skin and bone, and feels sure they will fail to breed again, the second season in succession. There is no crop of berries, and sparrows and blackbirds have taken everything eatable.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 9th September, 1907.

Professor A. J. Ewart, D.Sc., Ph.D., one of the vice-presidents, occupied the chair, and about 40 members and visitors were present.

CORRESPONDENCE.

The following letter from Mr. Chas. Walter, dated 10th August, 1907, was read :—

To the President and Members of the F.N.C. of Victoria.

Gentlemen,—By the August *Naturalist*, received to-day, I learn that Professor Ewart at the last meeting of your society took occasion to criticise a paper of mine read before your Club on the 14th August, 1899, and published in the *Naturalist*, vol. xvi., p. 99. In referring to the list of plants new for Victoria, he said "practically the whole of this part of the list becomes valueless, although its compilation must have entailed a good deal of trouble to its author." Now, in the first place, I would point out that nowhere in my paper did I claim to make the first record, as Professor Ewart seems to imply, of any of the plants mentioned. My object, as clearly shown by the last paragraph, which Professor Ewart surely cannot have read, was simply to bring the list of Victorian plants up to date in the *Victorian Naturalist*, since no list of plants new to Victoria had been published in your journal since November 1893, nearly six years before. Possibly I might have indicated my meaning in plainer terms ; but was it likely that I would claim as new for Victoria two plants named and described by Mr. F. M. Reader in your journal two years before? My intention was simply to publish a supplemental list of Victorian plants, as had been done by the late Baron von Mueller in 1887 and 1893, so that local collectors might be saved the trouble of consulting the records at the National Herbarium, and in this I had the concurrence and assistance of the late Mr. J. G. Luehmann, Curator of the National Herbarium. Had Professor Ewart's communication appeared in this month's *Naturalist* I could have spoken regarding others of my so-called errors. However, I trust that, in fairness to me, this explanation will be published in the next issue of the *Naturalist*.—I am, yours, &c.,

CHAS. WALTER.

Prof. Ewart said that, as published, the list could not help but be misleading to future workers unless corrected. He was glad of the explanation, but hoped that in the future neither correction nor explanation would be necessary.

Mr. F. G. A. Barnard said he considered Mr. Walter's intention was for the best, and would not have been so open to criticism if the term "unlisted" had been used in place of "unrecorded." Of course, he did not excuse Mr. Walter for any real errors, such as had been pointed out by Professor Ewart.

REPORTS.

A report of the excursion to Greensborough on Saturday, 24th August, was furnished by the leaders, Messrs. Kearland and Barnard, who reported a good attendance of members. The former, in dealing with the ornithological results, said that, considering the locality, birds were rather scarce, and only familiar species were seen. A nest of the Yellow-rumped Acanthiza, containing three eggs, was found, while a Harmonious Thrush seemed to be nesting near the Plenty River. Regarding the botany, Mr. Barnard said that the party found the Silver Wattle, *Acacia dealbata*, just at its best, the trees being a mass of golden-yellow blossom, while several other acacias were also noted in bloom. The Tree Violet, *Hymenanthera Banksii*, was flowering profusely, but the most interesting flower found was the delicate *Grevillea rosmarinifolia*, which grows sparingly on the rocky banks of the stream.

A report of the junior excursion to Royal Park on Saturday, 7th September, was given by the leader, Mr. T. S. Hall, M.A., who said that there was an attendance of about 20 juniors, and an interesting afternoon was spent in studying the geology of the railway cutting, which has frequently been described before the Club.

The hon. librarian reported the receipt of the following donations to the library :—"Annual Report of Department of Mines and Water Supply, Victoria," for 1906, from the Department ; *Journal of Agriculture of Victoria*, vol. v., part 8, August, 1907, from the Secretary for Agriculture ; "Nests and Eggs of Birds Found Breeding in Australia and Tasmania," by A. J. North, C.M.Z.S., vol. ii., part 2, from the Trustees, Australian Museum, Sydney ; "Proceedings of the Linnean Society of New South Wales," 1907, part 2, from the Society ; *Agricultural Gazette of New South Wales*, vol. xviii., part 8, August, 1907, from the Secretary for Mines, Sydney ; "Ferns of Tasmania," by L. Rodway, Government Botanist, from the Tasmanian Field Naturalists' Club.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. J. A. Leach, Barry-street, Carlton, and Mr. J. C. Robinson, Cambridge-road, Box Hill, were duly elected as ordinary members ; Mr. Wm. Hy. Farr, Flinders, as a country member ; and Masters J. M'Cutcheon, Boundary-road, Malvern, and Francis C. Clements, Bruce-street, Toorak, as junior members.

GENERAL BUSINESS.

Prof. Ewart referred to the proposed rule submitted by him to the general meeting on the 12th ult., and again urged the desirability of having a specimen of any new plant recorded in the

Victorian Naturalist handed over to the Club for future reference, and read a letter from Mr. F. M. Reader strongly approving of the suggestion. He desired to move that the following recommendation be added to the notice paper in the Club's journal, viz. :—"It is earnestly desired that in all cases of new plant records at least one specimen of the plant recorded be forwarded for exhibition, and, if possible, presented to the Club."

This was seconded by Mr. T. S. Hall, M.A., and carried.

PAPERS READ.

1. By Mr. F. G. A. Barnard, entitled "Over the Dividing Range."

The author gave some interesting details of two short excursions made from Lancefield across the Dividing Range, and exhibited a quantity of chips and several unfinished stone axes from the aboriginal quarries at Mt. William. He also recorded the finding of the bipinnate form of the fern *Lomaria discolor* at Musk Gully.

Mr. F. Pitcher remarked that this variety of the common Lomaria had been thought to be confined to a certain locality in Gippsland, but he had recently heard of its having been found in the Macedon district, not many miles from where Mr. Barnard had noted it. He also stated that a specimen at the Botanical Gardens had recently been robbed of its spore fronds just as it had been determined to utilize them for propagating purposes.

2. By Mr. A. D. Hardy, F.L.S., entitled "Early Spring in the Plenty Ranges."

The author referred to many of the plants and shrubs to be found in bloom in the ranges in the early spring, and drew attention to the pronounced glaucous appearance of the phyllodes of the Golden Wattle, *Acacia pycnantha*, and at high altitudes to the less conspicuous but still noticeable pointing of many of the phyllodes of the same species.

Professor Ewart said that the explanation of the points referred to by the author with regard to *Acacia pycnantha* was that both were devices to enable the trees to more quickly shed the moisture prevailing at the higher altitudes.

NATURAL HISTORY NOTES.

Mr. R. W. Armytage mentioned that during July last English Blackbirds had been seen freely eating the berries of the Pepper Trees, *Schinus molle*, in the University grounds.

Mr. Armytage also referred to the case of some English oak trees at Essendon having their lower branches in full leaf on the 10th August, while all the upper branches were in their normal winter condition, leafless.

Prof. Ewart called attention to a piece of Wistaria stem

exhibited by him, which had been used for the purpose of demonstrating the length of the vessels by injecting them with mercury. The stem had afterwards been stuck in the ground, and was now sprouting, showing that it was not affected by the mercury.

EXHIBITS.

By Mr. J. W. Audas.—Two assegais as used by the Kaffirs in the recent rebellion in South Africa.

By Mr. F. G. A. Barnard.—Dried frond of fern, *Lomaria discolor*, var. *bipinnatifida*, from Dividing Range, also unfinished native axes, rocks, &c., from Mt. William, in illustration of his paper.

By Miss S. W. L. Cochrane.—Orchids from Healesville, *Pterostylis nutans* and *P. longifolia*.

By Miss C. Cowle.—Dried plants from Sydney, Blue Mountains, &c.

By Mr. H. J. Coles.—Pair of Pink-breasted Robins (*Petrœca rhodinogastra*), male from Mt. Dandenong, female from Ferntree Gully.

By Prof. A. J. Ewart, D.Sc., Ph.D.—Stem of Wistaria, sprouting after injection with mercury.

By Mr. F. Pitcher, on behalf of the Director, Melbourne Botanic Gardens.—Blooms of the following acacias now flowering in the Melbourne Botanic Gardens, additional to those shown at previous meetings :—*Acacia acinacea*, Lindley, Governor La Trobe's Acacia, Vict., N.S.W., S. Aust. ; *A. leprosa*, Sieber, Scurfy Acacia or Native Hickory, Vict., N.S.W. ; *A. longifolia*, Willd., Long-leaved Acacia, Vict., N.S.W., Qld., S.A., Tasm. ; *A. lunata*, Sieber, Golden Glory Wattle, Vict., N.S.W., Qld. ; *A. melanoxylon*, R. Brown, Blackwood Tree, Vict., N.S.W., S. Aust., Tasm. ; *A. montana*, Bentham, Mountain Acacia, Vict., N.S.W., S. Aust. ; *A. oxycedrus*, Sieber, Juniper Wattle, Vict., N.S.W., S. Aust., Tasm. ; *A. prominens*, A. Cunn., Fringed Acacia, N.S.W., and Qld. ; *A. pycnantha*, Bentham, Golden Wattle, Vict., N.S.W., S. Aust. ; *A. Riceana*, Henslow, Rice's Acacia, Tasmania ; *A. saligna*, Wendland, Weeping Wattle, W. Aust. ; *A. stricta*, Willdenow, Upright Acacia, Vict., N.S.W., and Tasm. ; *A. verniciflua*, A. Cunn., Varnish Wattle, Vict., N.S.W., S. Aust., and Tasm. ; *A. verticillata*, Willd., Whorl-leaved Acacia, Vict., N.S.W., S. Aust., Tasm.

After the usual conversazione the meeting terminated.

Tasmanian Museum, Hobart.—We have to congratulate our fellow-member, Mr. Robert Hall, F.L.S., C.M.Z.S., on his appointment to the position of Secretary and Curator of the Tasmanian Museum, Hobart, rendered vacant by the death of Mr. Alex. Morton, F.L.S. Mr. Hall enters on his duties early in January.

BUCHAN AND ITS CAVES.

By Messrs. T. S. Hall, J. H. Harvey, and W. Thorn.

(*Read before the Field Naturalists' Club of Victoria, 12th August*, 1907.)

Part I.—A Visit to Buchan. By T. S. Hall, M.A.

Early in December last I had an opportunity of visiting Buchan, a place that I had long wanted to see, as it is of great geological interest. The first day began with a railway journey of 170 miles to Bairnsdale, which was reached about the middle of the afternoon. At four o'clock the coach journey was begun, the first stage ending at Bruthen, where we arrived about eight o'clock, and before darkness had closed in.

Bairnsdale is only a few feet above sea-level, the steamers coming up to it from the Lakes. The Mitchell River is a fine, deep stream, and occupies a wide valley. Soon after crossing the river we climbed a long hill on to the extensive plateau which flanks the mountains to the north, and which had been in part traversed on the railway journey. It is built of great sheets of sands, gravels, and coarse conglomerates, which have been spread out by the rivers and streams partly on the Ordovician bedrock and partly on newer formations, such as the marine tertiaries. Between Bairnsdale and Bruthen the level of the plateau is about 500 feet above sea-level. It is deeply trenched by the valleys of the Mitchell, Nicholson, and Tambo, and the rich flats are extensively cultivated, maize being the principal crop.

At Bruthen the Tambo leaves the hills by a narrow gorge, and enters the wide flood plain which reaches down to the sea. Small steamers ply from Mossiface, a couple of miles down stream, to Bairnsdale, but cannot come up to Bruthen itself. The night was spent at Bruthen, and a start was made next morning at six o'clock. A bridge, 150 yards long, crosses the sandy bed of the Tambo, and on leaving this we immediately begin to climb once more on to the plateau. For the next four hours the drive was monotonous. The sandy and gravelly soil bore a fairly thick forest of stringy-bark, and the country reminded me of the Heytesbury Forest.

A stop was made at the Tara Hotel, on Boggy Creek, for breakfast. The name, taken from the Tara Range, which runs north from Nowa Nowa, is aboriginal, and not Irish, as might be supposed. The road now turned northerly, and traversed alluvial sands and quartz porphyries. The soil was poor, and the timber chiefly stunted stringy-bark. Here and there were marshy flats with reeds and rushes, and again we crossed a level patch covered with the two species of grass-tree. On some of the flats there was a glorious blaze of crimson bottle-brush. By the roadside could be seen the purple and white violet, a purple

orchid, Glossodia, a Styphelia, and long purple spikes of a Veronica-like plant which was unfamiliar to me.

We gradually climbed to South Buchan, where we came on limestones, and a small patch of what I took to be decomposed basalt. The vegetation changed for the better, and fences were once more to be seen. Soon we reached the edge of a great valley, and saw the Buchan River running east to join the Snowy. A steep drop of about 500 feet brought us down to the township of perhaps a dozen houses, widely scattered.

Buchan is not a Scotch word, but good Australian. Dr. Howitt occasionally spells it Bukkan. It means "dilly-bag"—the aboriginal lady's reticule.

The valley of the Buchan River is here about a couple of miles wide. The stream when I saw it was about 4 feet deep and 30 yards wide. It was running strongly over a bouldery bed, the boulders consisting chiefly of quartz porphyry and indurated ash, as has been described by Dr. A. W. Howitt. As well as these rocks there were numerous pebbles of blue limestone.

The Buchan limestone, of Middle Devonian age, overlies the quartz porphyries, which are Lower Devonian, and has been let down by faults, so that it is surrounded by a ring of forest-clad porphyry ranges. The limestone is sparsely timbered and richly grassed.

It is in this limestone that the caves are found. Limestone is a soluble rock, and the effect of percolating waters is to hollow out underground channels and cavities, and thus the caves are formed. Occasionally the roof of a cave falls in, and a funnel-shaped depression—a "swallow-hole"—is formed. In some places the swallow-holes are numerous, and many of them open into underground passages.

The caves are sometimes found opening into swallow-holes, and at others may be entered through doorways on the hillsides. As is usual in caves in limestone country, the dissolved limestone is frequently redeposited, and stalactites hang from the roof, stalagmites rise from the floor, while folds of drapery hide the walls.

The chief object of my visit was to inquire into the truth of statements in the newspapers as to the presence of mammalian bones in the floors of the caves. As a result of the visit a careful search was afterwards made, and an important collection of bones was obtained by the National Museum, but their story I must leave others to tell.

Part II.—The Caves Twenty Years Ago. By J. H. Harvey.

The Buchan Caves had been known for some years as well worth visiting, and several attempts had been made to photograph them, but it was not till 1888, in company with Mr. J. Stirling,

F.G.S., the then Government Geologist, that I succeeded in obtaining the first good photographs of them, slides of which I purpose showing on the screen to-night.

I was so impressed with the beauty of the caves, as then existing, that when visiting the Jenolan Caves, New South Wales, some time afterwards, I spoke of them to Mr. J. Wilson (opener-up of and then caretaker of Jenolan Caves), and on a subsequent visit to Jenolan provided Mr. Wilson with photographs and a description of the caverns. The result was that Mr. Wilson offered to go to Buchan and devote a fortnight to exploration, providing that he could do so free of cost. Through my efforts arrangements were made for Mr. Wilson's free conveyance from Bairnsdale to Buchan and back, together with free accommodation during the time he was to remain at Buchan. His conveyance between Jenolan and Albury had been arranged for, and all that remained was to provide him with a passage over the Victorian lines from Albury to Bairnsdale.

The late Mr. Foster, then member for the district, was now approached in order to try and induce the Government to grant Mr. Wilson a railway pass over the North-Eastern and Gippsland lines, but without avail. Subsequently, when Mr. Foster became Minister of Mines, I again pressed the matter upon him, but still without result, and as there was nothing to justify either party in paying the railway fare out of his own pocket for a national cause, and it appeared hopeless to induce the Government to grant the necessary privilege, the matter was allowed to drop, although after this I frequently brought the claims of the Buchan district forward when lecturing on the Jenolan Caves. Mr. Stirling also left no stone unturned in his efforts to point out the value of the caves to Victoria from a tourist's point of view.

The caves visited in 1888 were the Spring Creek, Wilson's, and Dickson's.

Spring Creek Cave is at the back of the township, in the valley of Spring Creek, and about three-quarters of a mile from the police station. The entrance is by a narrow doorway in the hillside, and going along some distance we reached a step in the floor, and at the foot of this a small excavation we made revealed a number of small fragments of bone. These were, I believe, submitted to the late Professor M'Coy, but I never heard anything further of them.

Leaving this point, we followed the passage for 50 or 60 feet, descending the whole time, and it became smaller and more irregular; at about 150 feet an aperture led into what we called the "Piano Chamber." This name was given it on account of a small formation on the wall only a few inches square, in the form of approximately parallel ridges, each of which gave out a clear, ringing note when struck.

Returning to the main passage we ascended a ladder, and so reached the top of a small hump a few feet high; this was very narrow, and we descended to the floor on the other side of it, which was about 18 or 20 feet lower, partly by a rope and partly by means of the ladder. The floor of this ridge is apparently an old stalagmital formation, and portion of it overhangs a few inches. All this formation is very dark-coloured.

The passage thus reached is, though lofty, very narrow, and its walls are covered with rough drapery, and, following along several circuitous passages, we eventually reached a small chamber which had been discovered by Mr. Ralston, and termed the "Surprise Chamber"; this was the best chamber seen in the Spring Creek Cave. All the formations in this cave are old, dry, and dead.

Wilson's Cave.—This is situated on the Buchan River, about two miles below the township. The entrance is by a well-defined doorway in the hillside. The first chamber is a vestibule about 12 feet in height and 10 feet wide, and on the right hand we saw an opening, partly blocked by the roof, which had fallen in. Here was a luxuriant growth of ferns and other plants. The passage here is a few feet wide, and following it we reached, in a few yards, another chamber, the floor of which was very rough and filled with coarse gravel.

Then we entered the "Royal Chamber," the height of which we estimated at about 60 feet; the width is irregular, being perhaps 30 to 40 feet in the widest part. The chamber is roughly divided into two unequal parts by a rocky mass covered with stalactites and stalagmites, the central feature of which forms a rough fluted column, the mass being pierced in places. The colour is dark reddish brown, and at the base is a narrow passage, which we called the "Fat Men's Misery." The face of this part is of a dirty white colour, well fluted, and, to the best of my recollection, is about 3 to 4 feet square. About the middle of the larger part of the chamber is a recess about 20 feet above the floor, forming a natural balcony with an opening to the large chamber. This recess is easily reached by a small fissure, the grade being easy and the passage clear. Hanging over this opening is a fairly good mass of stalactital drapery. The formations in this cave are mostly dark coloured, with cream coloured masses here and there, and they are dry and dead as in the Spring Creek Cave.

Dickson's Cave.—This is in a small range dividing the Buchan and Murrindal Rivers, about 5 miles from Buchan. There are two entrances, about 100 yards apart, and very rough, and they are of considerable size. In one the floor of the vestibule was a few feet below the doorway, and we noticed the remains of two bullocks which had fallen down and perished. In each of these caverns progress, up to a certain point, was easy. The first we entered contained a large, irregular vestibule, and

leading from this was a tortuous passage which ultimately opened into a long, lofty gallery, the walls of which were lined with dark and dingy formation, not at all of a striking nature. The principal interest was the weird effect of this gallery, all the formations being deeply stained. In one part we struck a deposit of very small bones in a sort of seam ; these were all broken and mixed together in a confused mass. The lobby to the other cavern opened into a second chamber, with nothing particular to attract the eye, but on looking outwards towards the entrance a fine effect was obtained : the drapery formation clinging to the rocks, being illuminated by the daylight which streamed through fissures in the hillside, looked very showy. Continuing, we reached a passage 3 to 4 feet wide, and sufficiently lofty for us to walk upright in for some distance. At the end of the passage, which terminated abruptly, was a precipitous descent into a very large chamber, and this stopped further progress, as we had neither ropes nor tackle for exploration. The size of this chamber could not be estimated, as the magnesium light failed to reveal any walls. We could see great rough masses of stalactital drapery pendent from the ceiling several yards in advance of us, and beyond that darkness reigned again. I was sorry that we had no means of further exploring this cave, as it appeared to me to offer greater prospects than any other caverns we had seen there. This was the last cave we saw, and we returned after having devoted four days to the actual traversing and photographing of the caverns.

The foregoing description is, I think, fairly accurate, but, considering it is nearly nineteen years since I was there, it is possible I may have forgotten some of the details.

The route by which I reached Buchan was the same as that taken by Mr. T. S. Hall, through Boggy Creek, and the only thing I remember about the drive is that it was a very dreary and uninteresting one, and the road was in poor condition, being very soft and boggy in some places and sandy in others—not at all good.

Part III.—The Recently Discovered Caves.

By W. Thorn, District Surveyor.

The old Spring Creek Cave, which is situated on a reserve about one mile south-west from the Buchan Post-Office, has been known for many years, and at one time contained fine stalactites, but all the crystal formations have now been destroyed by visitors, and it is impossible to say what the cave was like originally.

The cave is easily accessible, and of considerable extent, containing several lofty chambers and branches. At the end of the cave there is an interesting chamber, the walls of which are

covered with an incrustation of carbonate of lime somewhat resembling coral.

In September, 1906, Mr. Moon, the caretaker, discovered a cave (locally known as the Moon Cave) on the northern bank of Spring Creek, near its junction with the Buchan River. It has a pretty approach on the side of the hill, between 40 and 50 feet above the river. The entrance is through a small, rough tunnel, leading into a small chamber, and then a sudden descent by ladders to the bottom of the cave, which follows an underground watercourse about the level of the river. At the time of my visit, in April last, there was just a trickle of water, but there were indications that the water rises two or three feet at times, either from being backed up from the river or heavy rain. Along the cave are holes several feet deep in which trout (?) can be seen. Platypus have also been seen, and bats are fairly numerous.

Working up stream in a north-westerly direction, the cave is a long winding passage, in parts a narrow, lofty cleft, opening out here and there into wide and lofty chambers ; in other parts, the roof is only three or four feet high. Generally speaking, the walls of the cave are rugged or water-worn rocks, with groups of beautiful stalactites and a few stalagmites, mysteries, and terraces.

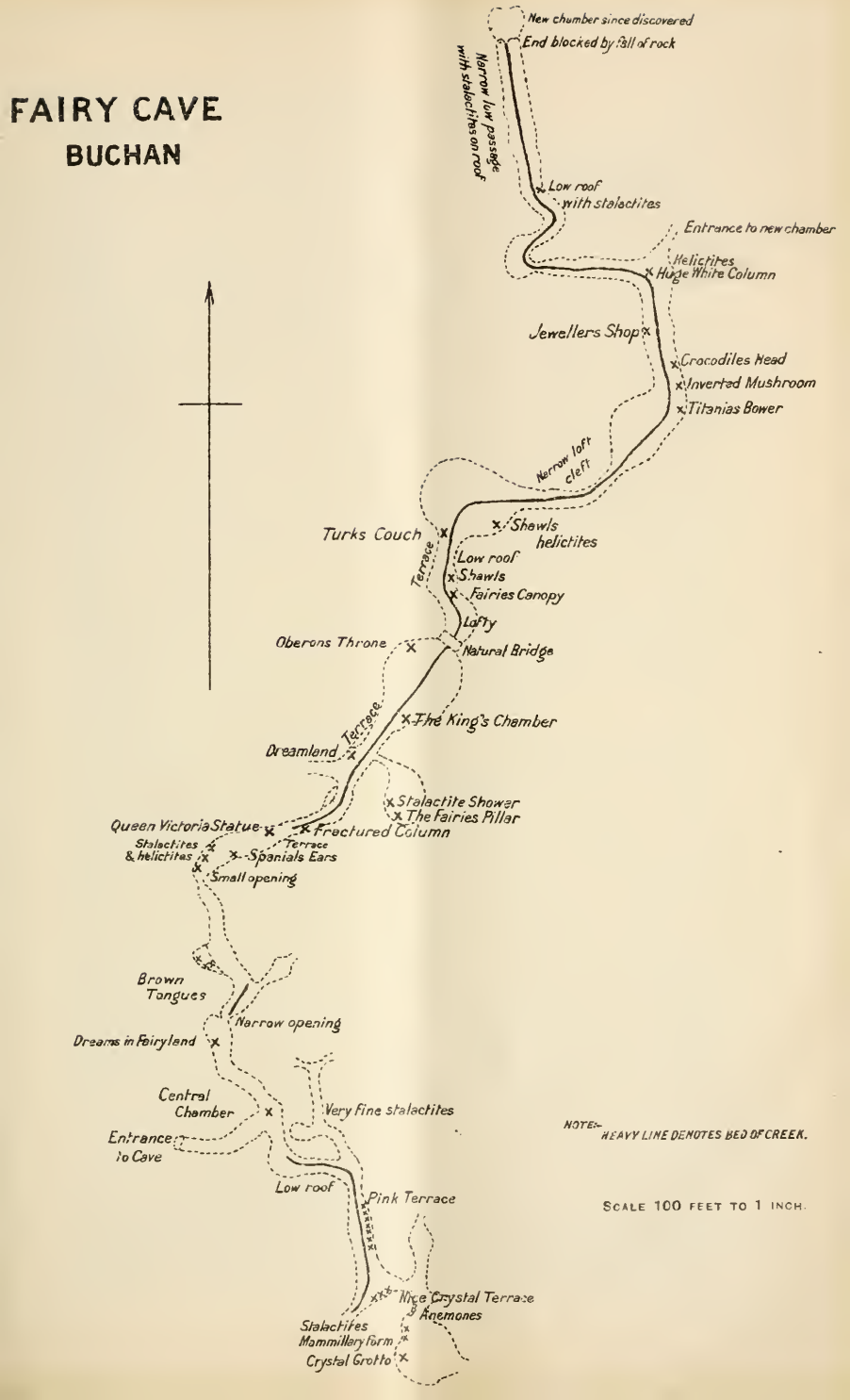
The south-east or down-stream part is entered by a short, low passage in which the water is nearly three feet deep and the roof about two feet above the water. It consists of several small chambers containing groups of beautiful stalactites of various forms and colours, also a few stalagmites, terraces, and pillars. To reach the end it is again necessary to wade through a small opening where the roof of the cave is little more than a foot above the water.

The Kitson Cave.—In December, 1906, Mr. Moon discovered another cave, close to the Spring Creek Cave, which he named the Kitson Cave, after Mr. A. E. Kitson, F.G.S., of the Geological Survey Branch of the Mines Department. At present it can be entered only by the aid of a rope 25 feet long down by overhanging rocks which appear far from safe to disturb.

This cave consists mainly of a very large and lofty chamber, the floor of which is strewn with great blocks of fallen rock. It contains several groups of fine stalactite formations, and the finest column to be seen in the district. There are several small branch chambers, one containing three small shawls as well as stalactites.

The Fairy Cave.—On the 18th March, 1907, Mr. Moon opened up a small hole (just large enough to admit a hand) on the hillside near the Spring Creek Cave and entered this cave, which far excels in extent and beauty all others discovered in the district.

FAIRY CAVE
BUCHAN



There is a vertical descent of 11 feet by ladder, then by another ladder and floor sloping in an easterly direction for 60 feet to a depth of over 50 feet into a rugged and lofty chamber, whence there are two main branches, the longer bearing northerly and north-easterly for about 900 feet, the shorter bearing south-easterly for over 200 feet, probably connecting with the Spring Creek and Kitson Caves.

Taking the latter branch, a descent is made from the central chamber by a passage sloping in an easterly direction to the bed of the underground watercourse, about 15 feet below ; a low passage about three feet high is followed east for 60 feet, where there is a narrow, lofty branch chamber rising to the north, containing fine stalactites, shawls, tongues, and small stalagmites. The main branch follows up stream for 70 or 80 feet ; at first the roof is flat, about four feet high, studded with short stalactites ; on the left, for the greater part of the distance, there is a beautiful wide terrace sparkling with crystals ; at the end is a fine group of white stalactites. Near the end, over the terrace, is a small opening leading into a roomy chamber with several branches. In the chamber are fine stalactites, terraces, and stalagmites. Off this chamber is the Crystal Grotto, studded with beautiful crystals, the upper part being white and the lower dark amber colour. On the rocks are delicate formations resembling anemones, with semi-transparent outer bowl enclosing a pink centre.

Returning to the central chamber near the entrance the northern branch follows a rugged passage, and in a distance of about 70 feet descends to the bed of the creek, but in a few feet it rises again, and a rough, rugged passage is followed for about 120 feet, where the bed of the creek is again reached through a small opening just large enough to squeeze through ; from there on the floor of the cave is the bed of the underground watercourse, which is followed for 650 feet till blocked by a fall of rock.

It will take too long to give a detailed description of the cave, which, generally speaking, consists of, a long, winding passage, narrow and lofty in some parts and low in others, opening out into large, spacious chambers. Along the greater part of the cave are groups of beautiful stalactites of various forms and colours hanging from the roof or canopies jutting out from the walls ; several fine blankets are met with, and for considerable distances beautiful terraces sparkling with crystals follow the line of the stream.

The accompanying plan, drawn on the scale of 100 feet to 1 inch, will perhaps enable the positions of the different features to be more readily grasped.

Photographs give but a poor impression of the beauties of the stalactite and crystalline formations, of endless variety and shades of colour, which must be seen to be realized and appreciated.

Assuming the Buchan River to be 400 feet high above sea level, the height of the entrance is 530 feet, the lower end of the cave 460 feet, and the top of the hill 710 feet approximately. It is possible other extensive caves or branches may be discovered.

On the 14th April Mr. Moon and myself were examining the hill over the Wilson's Cave, when Mr. Moon found a small hole, just large enough to get through. We were unable to go far without ropes. It was here that Mr. Moon subsequently discovered some fossil animal remains, which have not yet been fully identified.

[Each part of the paper was well illustrated by lantern slides. —Ed. *Vict. Nat.*]

Romulea or Onion Grass.—In an article in the *Victorian Journal of Agriculture* for September, Prof. Ewart, D.Sc., Ph.D., Government Botanist, deals with this little introduced irid, which has become a troublesome pest in many parts of the State, more especially around the metropolis. The plant was regarded by Baron von Mueller as *R. bulbocodium*, L., but Prof. Ewart identifies it as *Romulea cruciata*, Ker-Gawl, though it is not quite identical in all its characters with that species, and may be an Australian evolved variety. A number of experiments have been conducted with a view to its eradication, but in most cases the cost of treatment would be prohibitive on a large scale, and the only practical plan seems to be to plough the affected land, break up well, and manure heavily.

Protection of Bird Life in New Zealand.—Concerning the Little Barrier Island bird sanctuary, situated at the entrance to Hauraki Gulf, near Auckland, the caretaker of it reports that it is evident from year to year that the bird-life on the island continues to increase. Several of the rarer species, now just about extinct on the mainland, are thriving in a very satisfactory manner. Owing to the warm, early spring, the birds commenced nesting early, so that by December there were numbers of young birds on the flats—Tuis, Bell-birds, Whiteheads, Tits, Fantails, and Wrens all being well represented. There had been a marked increase in Robins and Stitch-birds, while the Rifleman, the smallest of New Zealand birds, had been seen in several places. He speaks of the Long-tailed Cuckoo (Koheperoa) as the worst enemy the other birds have, as he has known it fly off with a newly-hatched bird.

Victorian Foraminifera.—At the May meeting of the Queckett Microscopical Club, London, a paper on the Recent Foraminifera of Victoria was contributed by Mr. F. Chapman, A.L.S., F.R.M.S., Palæontologist, National Museum, Melbourne. The author dealt with existing literature of the subject, the geology of the localities where found, and gave a list, with distribution tables, of 103 species.

The Victorian Naturalist.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 14th October, 1907.

The president, Mr. G. A. Keartland, occupied the chair, and about 90 members and visitors were present.

REPORTS.

A report of the excursion to Sandringham on Saturday, 14th September, for botany and pond life, was submitted by the leaders, Messrs. C. French, jun., and J. Shephard. There was a good attendance of members, who divided into two parties, the botanists keeping along through the tea-tree belt as far as Black Rock, where they turned inland, and thence back to the station. It was noticed that many of the Banksias and the bushes of *Acacia longifolia* were either dead or dying, as the result of the borings of the larvæ of the beetles Piesarthrius and Uracanthus, or the attacks of the scale-insect, *Aspidiotus rossi*. Several orchids were collected under the tea-trees, such as *Pterostylis nana*, *P. pedunculata*, and *Caladenia latifolia*, but the dryness of the season greatly reduced the number of species of plants found in bloom. Regarding the pond life, Mr. Shephard stated that owing to the continued dry weather the usual ponds visited were rapidly drying up ; however, a number of interesting forms were collected for home examination.

A report of the excursion to Ringwood on Saturday, 28th September, for botany and ornithology, was submitted by the leaders, Messrs. C. French, jun., and C. F. Cole, the former taking charge of the botany in the absence of Dr. Sutton owing to illness. There was a good attendance of members, and a fair number of botanical specimens were collected. Among them may be mentioned—*Phylloglossum Drummondi*, *Polypompholyx tenella*, a rare yellow variety of *Daviesia corymbosa*, *Euphrasia Brownii* ; and among the orchids collected were *Caladenia suaveolens*, *C. Cairnsiana*, and *Diuris punctata*. Only about a dozen species of birds were recorded by Mr. Cole as having been seen during the ramble, none of them being of any great rarity. Amongst those seen were the Black-faced Cuckoo-Shrike, Striated Tit, Yellow-rumped Tit, Blue Wren, Grallina, and Grey Shrike-Thrush.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. M. F. Kemp, 17 Motherwell-street, Hawksburn, and Mr. W. S. Littlejohn, M.A., Scotch College, Melbourne, were duly elected as ordinary members ; Mr. Howard Bell, Illawarra-road, Hawthorn, as an associate ;

and Miss Joyce Bruford, 157 Victoria-road, Upper Hawthorn, Miss Violet Wells, 11 High-street, St. Kilda, and Miss Lily Kelly, 316 Elizabeth-street, Melbourne, as junior members of the Club.

GENERAL BUSINESS.

Mr. A. Mattingley submitted some particulars regarding a portion of the Mallee district near the South Australian border, which he thought was very desirable for permanent reservation as a National Park, and suggested the Government should be approached by the Club on the subject. It was decided that the matter be referred to the committee for consideration.

Mr. A. D. Hardy, referring to Prof. Ewart's motion, carried at the last meeting of the Club, in which it was desired that in all cases of new plant records at least one specimen of the plant recorded be forwarded for exhibition, and, if possible, presented to the Club, said he thought it should be extended to all branches of natural history. It was only fair that the National Museum should be treated similarly to the National Herbarium. He gave notice that he would move to that effect at the next ordinary meeting.

Mr. Barnard, referring to the wild flower show, asked members, when requesting friends in the country to forward specimens, to give more precise directions as to packing. He regretted that some of the flowers forwarded were spoilt owing to defective packing.

The death of the late Mr. C. Walter was referred to by Mr. D. Best, who said that, though not of late years a member of the Club, Mr. Walter had rendered much assistance to the Club in the past, and many members were under obligations to him. His loss was greatly to be deplored. Mr. Best thought that an expression of regret should be recorded in the minutes. Tributes of respect were also paid by Messrs. G. A. Keartland, F. G. A. Barnard, and D. M'Alpine, and on Mr. Barnard's suggestion it was decided that a letter of condolence be sent to Mr. Walter's relatives.

Great regret was expressed at the loss sustained by the hon. secretary, Mr. J. A. Kershaw, through the recent death of his mother, and on the motion of Messrs. O. A. Sayce and J. Shephard, a resolution of sympathy with Mr. Kershaw in his bereavement was carried, and the assistant hon. secretary was instructed to forward a letter of condolence on behalf of the Club.

PAPERS.

1. By Mr. O. A. Sayce, entitled "Description of a New Remarkable Crustacean with Primitive Malacostracan Characters."

In this paper the author gave a preliminary description of a new form of fresh-water crustacean, differing so essentially from all known allied forms that he has considered it necessary to

create not only a new genus, but a new family, for its reception, In general form and structure it resembles the Tasmanian stalk-eyed species, *Anaspides tasmaniæ*, G. M. Thomson, but differs, among other important characters, in the eyes being sessile, the absence of the antennal scale, and in the coalescence of the first thoracic somite with the head. This species, the largest of which only measures 9 mm., was obtained in fresh-water reedy pools at Ringwood, near Melbourne, and is regarded by the author as the most primitive sessile-eyed Malacostraca at present known. The author illustrated his remarks by diagrams on the blackboard.

2. By Professor A. J. Ewart, D.Sc., Ph.D., F.L.S., entitled "Victorian Plant Records."

In a previous paper the author drew attention to a number of erroneous or unnecessary records of native plants as new to Victoria, and in the present paper similar instances are given regarding naturalized introduced plants.

NATURAL HISTORY NOTES.

Mr. R. W. Armitage drew attention to his exhibit of a large yam, *Dioscorea butatus*, from the Trobriand Islands, Papua. The specimen measures 33 inches long and 5 inches in diameter, and weighs 20 lbs. It is the edible root of a tropical climbing plant, and forms, with taro, the principal food of the islanders, being used in a similar manner to the ordinary potato.

Mr. C. F. Cole mentioned as new bird arrivals in the Hawthorn district the Rufous Song-Lark, *Cinclorhamphus rufescens*, Vig. and Hors.; the White-shouldered Caterpillar-eater, *Lalage tricolor*, Swains.; and the Rose-breasted Robin, *Petræca rosea*, Gld.

EXHIBITS.

By Mr. R. W. Armitage.—Specimen of yam, *Dioscorea butatus*, from Trobriand Islands, Papua.

By Mr. F. G. A. Barnard.—Growing fern, *Lomaria alpina*, from Mt. St. Bernard, December, 1902; and nest of Oriole, *Oriolus viridis*, from Doncaster.

By Mr. H. J. Coles.—Orchid, in bloom, from Blackall Ranges, Queensland; also triplet nest of Scarlet-breasted Robin, *Petræca leggii*, Sharpe, built in spouting of shed; locality, Mt. Dandenong.

By Miss Lillian Horner.—Stone used in fire-walking ceremony in Suva, stone axes from Fiji, whale's tooth (weight, 1 lb. 3 ozs.), and cannibal fork dug up on site of old native village, Naitisiri, Fiji.

By Mr. C. Oke.—Insects collected on Wheeler's Hill excursion on 12th inst., including female and egg of beetle, *Euops falcata*, with rolled tip of gum leaf, inside which it had deposited its egg.

By Mr. O. A. Sayce.—Living specimens of the new crustacean, *Koonunga cursor*, in illustration of his paper.

EXHIBITION OF WILD FLOWERS.

Owing to the spring season having been the driest for many years, it was not expected that the usual exhibition of wild flowers would bear comparison with those of former years, but, thanks to the energy of several members, a very good display resulted, while a very fine exhibit of Australian flowers grown in the Melbourne Botanic Gardens was staged by the Director, Mr. W. R. Guilfoyle, F.L.S., which included a number of species well worthy of extended cultivation. Various distant parts of the State, such as Bendigo, Lindenow, the Grampians, Dimboola, and Bunyip, were represented, while localities nearer town, such as Mentone, Beaumaris, Kangaroo Ground, and Croydon, had also been levied on for specimens. The following is a fairly complete list of the principal exhibits :—

By Mr. J. W. Audas.—About 25 species from Mt. Birchet, Mirranatwa (Grampians), including *Thrytomene Mitchelliana*, *T. ciliata*, *Styphelia pinifolia*, *Pultenæa mollis*, *Calycothrix Sullivani*, *Conospermum Mitchelli*, *Grevillea oleoides*, *Helichrysum Baxteri*, *Brachyloma depressum*, and *Dariesia brevifolia*.

By Mr. J. W. Bainbridge.—About 20 species from Croydon, including *Comesperma ericinum* and *Thelymitra ixioides*.

By Mr. F. G. A. Barnard.—About 10 species from Kew, including *Styphelia strigosa*, *Melaleuca ericifolia*, and *Myoporum viscosum*; also about 20 species from Wheeler's Hill excursion.

By Miss Cochrane.—About 50 species from Beaumaris, Kangaroo Ground, and Bunyip, including *Thelymitra antennifera*, *Utricularia dichotoma*, *Myoporum insulare*, &c.

By Mr. G. Coghill.—About 100 species from Emerald, Olinda Vale, and Tunstall, including *Pultenæa daphnoides*, *P. villosa*, *Hedycarya Cunninghami*, *Daviesia ulicina*, var. *ruscifolia*, *Calochilus Robertsoni*, *Eriostemon correifolius*, &c.

By Mr. S. W. Fulton.—About 50 species from Mt. Dandenong and Croydon, including *Tecoma australis*, var. *Latrobei*, *Diuris longifolia*, *Pterostylis cucullata*, var. *alpina*, *Sphærolobium denudatum*, &c.

By Miss Montgomery.—About 15 species from Bendigo, including *Eriostemon obovalis*, *Helichrysum obcordatum*, *Thelymitra aristata*, &c.

By Mr. W. A. Milburn.—About 15 species from Tooradin, including *Caladenia Menziesii*, *Pterostylis pedunculata*, &c.

By Mr. Sweetnam.—About 25 species from Lindenow, Gippsland, including *Correa speciosa* (red variety), *Diuris sulphurea*, *Sprengelia incarnata*, &c.

By Mr. G. W. Talbot.—About 40 species from Dandenong, including *Diuris punctata*, *Podolepis acuminata*, &c.

By Mr. J. R. Tovey.—About 20 species from Mentone, including *Prasophyllum elatum*.

By Mr. J. J. Wilson.—About 20 species from Dimboola, including *Helichrysum leucopsidium*, *Swainsona procumbens*, *Calycothrix tetragona*, *Billardiera cymosa*, &c.

Flowers of the following Australian plants then in bloom in the Melbourne Botanic Gardens were exhibited by Mr. F. Pitcher, on behalf of the Director, Mr. W. R. Guilfoyle, F.L.S. :—

*Acacia macradenia, Benth., Port Mackay Wattle, Q.
Aphanopetalum resinosum, Endl., Gum Vine, V., N.S.W., and Q.
Astrotricha floccosa, D. C., Australian Dagger-leaf Bush, N.S.W. and Q.
Bauera rubioides, Andr., Wire Scrub, V., N.S.W., Q., S.A., and T.
Boronia elatior, Bartl., Tall Boronia, W.A.
floribunda, Sieb., Many-flowered Boronia, N.S.W.
heterophylla, F. v. M., Various-leaved Boronia, W.A.
Brachysema lanceolatum, Meissn., Lance-leaved Swan River Red Pea-flower Bush, W.A.
Buckinghamia celsissima, F. v. M., Lofty Buckinghamia, Q.
Cassia australis, Sims, Southern Cassia, V., N.S.W., Q., and N.A.
Calycothrix Sullivani, F. v. M., Sullivan's Hair Cup Flower, V.
Chorizema cordatum, Lindl., Heart-shaped Flame Pea Bush, W.A.
Commersonia Fraseri, J. Gay, Blackfellow's Hemp, V., N.S.W., and Q.
Dillwynia cinerascens, R. Br., Pride of the Heath, V., N.S.W., S.A., W.A., and T.
Eriostemon myoporoides, D. C., the Woolly Stamen Flower, V., N.S.W., and Q.
Eucalyptus sideroxylon, var. rosea, A. Cunn., Pink-flowered Ironbark, V. and S.A.
Epacris longiflora, Cavan., Long-flowered Australian Heath, V. and N.S.W.
Grevillea acanthifolia, A. Cunn., Acanthus-leaved Grevillea, N.S.W.
asplenifolia, Knight, Spleenwort-leaved Grevillea, N.S.W.
aquifolium, Lindl., Prickly Grevillea, V. and S.A.
hookeriana, Meissn., Tooth-brush Plant, W.A.
linearis, R. Br., Narrow-leaved Grevillea, N.S.W.
miqueliana, F. v. M., Miquel Grevillea, V. and N.S.W.
punicea, R. Br., Crimson-flowered Grevillea, N.S.W.
Hakea microcarpa, R. B., Small-fruited Hakea, V., N.S.W., and T.
purpurea, Hook., Purple-flowered Hakea, N.S.W., Q., and S.A.
Isopogon anemonifolius, R. Br., Anemone-leaved Cone Bush, V., N.W., and Q.
Hymenosporum flavum, F. v. M., Wing Seeds or Coin Pod, N.S.W. and Q.
Leptospermum myrsinoides, Schlecht, Myrsine-like Australian Tea-tree, V., N.S.W., and S.A.
Lasiopetalum Schulzenii, Benth., Schulze's Lasiopetalum, V. and S.A.
Melaleuca sparsiflora, Turcz., Sparse-flowered Tea-tree, W.A.
Micrantheum hexandrum, Hook. fil., Six-stamened Micrantheum, V., N.S.W., S.A., and T.
Olearia (Aster) myrsinoides, F. v. M., Myrsine-like Daisy Tree, V., N.S.W., S.A., and T.
(Aster) stellulata, D. C., var. lirata, Benth., Ridge Snow Bush, V. and T.
Pultenæa villosa, Willd., Hairy Bush Pea, V., N.S.W., and Q.
Prostanthera Sieberi, Benth., Sieber's Mint Bush, N.S.W.
rotundifolia, R. Br., Round-leaved Mint Bush, V., N.S.W., S.A., and T.
nivea, A. Cunn., Snowy Mint Bush, V., N.S.W., and Q.

* Additional to the Acacias exhibited at the August and September meetings

Stypandra glauca, R. Br., Greyish-green-leaved Stypandra, V., N.S.W., Q., and W.A.
Tecoma australis, R. Br., Wonga Wonga Vine, V., N.S.W., Q., N.A., and S.A.
Telopea speciosissima, R. B., Waratah of New South Wales
Thomasia purpurea, J. Gay, Purple Thomasia, W.A.
Veronica perfoliata, R. Br., Digger's Speedwell, V. and N.S.W.
Westringia glabra, R. Br., Smooth-leaved Native Rosemary Bush, V., N.S.W., and Q.
rosmariniformis, Smith, Australian Rosemary Bush, V., N.S.W., Q., and T.
Swainsona galegifolia, var. alba, R. Br., White-flowered Swainson Pea, N.S.W., Q., and S.A.
galegifolia, var. rosea, R. Br., Pink-flowered Swainson Pea, N.S.W., Q., and S.A.
galegifolia, var. Osbornii, R. Br., Osborne's Purple-flowered Swainson Pea, N.S.W., Q., S.A.

The late Mr. Chas. Walter.—It is with great regret we record the death, on the 11th October, at the age of 76, of Mr. Chas. Walter, the veteran botanical collector. Mr. Walter was well known to most of the botanical workers of the Field Naturalists' Club, and, from his long experience in the field, was often consulted by them when in doubt. He was a native of Mecklenberg, Germany, and had resided in the State for some fifty years. Soon after his arrival he commenced collecting seeds of native plants to send home to his sister in Germany. This brought him in contact with Dr. (afterwards Baron) von Mueller, the Government Botanist, who, seeing his fitness for the work, sent him plant-collecting in various parts of Victoria. He was instrumental in adding a large number of species to the Victorian list, especially from Eastern Gippsland, where he found the orchid *Dendrobium speciosum* on Victorian soil for the first time. In *Prostanthera Walteri*, F. v. M., found by him for the first time on Mt. Ellery, Croajingolong, his name will be kept in remembrance for all time. Though not a member of the Field Naturalists' Club at the time of his death, he was one of the earlier members, and on two occasions contributed to the pages of the *Naturalist*. His account of a visit to the Victorian Alps in January, 1899 (*Vict. Nat.* xvi., p. 81), inspired other members of the Club to follow in his footsteps, greatly to their benefit and pleasure. For some years Mr. Walter was employed at the Technological Museum, Public Library, arranging, labelling, &c., various economic products, grasses, seeds, timbers, &c., and did considerable work of a similar character for Baron von Mueller and the Agricultural Department, so that he came to be looked upon as an authority on Australian botany, and many correspondents in various parts of the world will miss the kindly way in which he was accustomed to supply information on botanical matters when an appeal was made to him.

OVER THE DIVIDING RANGE.

By F. G. A. Barnard.

(*Read before the Field Naturalists' Club of Victoria, 9th Sept.*, 1907.)

In May last I had an opportunity of crossing the Great Dividing Range, as we know it, at two places somewhat out of the course of the ordinary traveller. Lancefield, an old-established town, 46 miles almost due north of Melbourne, and standing 1,560 feet above sea level, was my starting point. I may say here that my visit to Lancefield was occasioned by the fact that, as a member of this Club, I was asked to deliver a natural history lecture to the local Improvement Society, and lead a field excursion of the District Teachers' Association.

The Lancefield district, as you probably know, is celebrated for its fertile soil, in which are raised immense crops of hay and potatoes, but, being on a high table-land, seems to be somewhat cold for the dairying industry. This fertile soil is the result of the volcanic activity which took place there in former times, how long ago none can tell. About a mile south of the town is Melbourne Hill, which I found time to ascend. This is a much-worn-down crater, and probably was the origin of the greater part of the volcanic outpouring of the district, though from its top other eminences can be seen which doubtless helped in the same direction. References to some of these will be found in an interesting paper read before this Club some years ago by Mr. T. S. Hart, M.A., entitled "The Volcanic Rocks of the Melbourne District" (*Vict. Nat.*, xi., p. 77). Melbourne Hill, which rises to perhaps 500 feet above the surrounding country, is cultivated to the summit, and in the season would afford a magnificent prospect of well-tilled farms. The fertility of the soil is also evidenced by the log fences still remaining as boundaries to some of the fields. These huge logs, probably the remains of giant red gums, will evidently last for many a day.

The quarter-sheets of the Geological Survey, published about forty years ago, show the geology of the district to be of a varied character. Pliocene, basalt, silurian, granite, and trap are all in close proximity to the town. Standing in the township and looking north, one seems to be surrounded by a circle of hills, the greater part being the Main Divide. To the south-west is Macedon and the Camel's Hump (Mt. Diogenes), next the Cobaw Ranges west and north-west; due north the range is slightly lower, while to the east is the more lofty Mt. William Range. This, however, is not portion of the Main Divide, but a parallel range, and separated from the Divide by the No. 3 or Boyd's Creek. The Deep Creek, which is the main source of the Saltwater River, as we know it nearer town, follows a circuitous course round the district. Taking Monument Creek as its most

southerly source, it rises almost due east of the Camel's Hump, then flows north for some five miles, closely hugging the foot of the range ; then, after an easterly course for another five miles, it turns south, skirting the Mt. William Range for about the same distance ; this it leaves towards Springfield, about two miles east of the town. It seems to me that Melbourne Hill, or some of its associates, may be responsible for this somewhat remarkable course, through having elevated the original land surface, and so forced the stream over as close to the ranges as was possible.

Musk Gully, a glen in the Dividing Range, about five miles north-west of the town, was chosen for the field excursion of the Teachers' Association. The road thither, after crossing the Deep Creek, passes through some poorly timbered country coloured as Newer Pliocene on the Geological Survey Quarter-Sheet No. 5, S.W. Silurian is then met with. Pliocene again appears, in the midst of which is a small patch of Volcanic, less than a quarter of a mile in diameter, called on the map "The Red Rise." I was told that without any other indication the position of this patch could always be told on the darkest night by the cold feeling experienced when passing over it. Presently our road became steeper, and outliers of the granite of the Dividing Range appeared, and in another mile the summit of the range, which is also the county boundary, was crossed close to the Big Hill State school, the school being only a few yards on the Dalhousie side of the Divide. After a brief spell here for lunch, we struck into the bush, south of the school-house, and found it a veritable tangle of young forest and granite rocks, some of the latter being of immense size. At that time of the year few plants were to be obtained in bloom. However, I was able to identify the majority of those collected. The one plant which seemed to be in its element in the granitic soil was *Pultenæa daphnoides*, of which many fine specimens were seen. *Styphelia humifusa*, *Kennedya monophylla*, *Clematis aristata*, *Indigofera australis*, and *Platylobium obtusangulum* were a few of the plants noticed, from which may be gathered the character of the vegetation. The little Rat-tailed Fern, *Asplenium flabellifolium*, grew in the crevices of the granite. Presently we found ourselves on the edge of the Divide, looking down into the valley of Tea-tree Creek, the steep slope a mass of huge granite rocks. Down this we gradually worked our way towards the little stream, encountering a dense growth of young wattles towards the bottom. At the stream a short halt was called, and attention directed to some of the plants noticed. On the opposite bank, near the site of an old saw-mill, grew a fine Manna Gum, *Eucalyptus viminalis*, in full bloom ; a golden everlasting, *Helichrysum*, sp., was in bloom on the hillside. Following up the little stream, which was bordered with Silver Wattles, apparently just ready to burst into

bloom, the valley gradually became narrower, and presently we came to a fern gully on a somewhat small scale, with Musk trees, *Aster argophyllus*, Hazel, *Pomaderris apetala*, Chrismas-tree, *Prostanthera lasiantha*, and other typical vegetation, while larger gums, &c., grew on the steep slopes, allowing little or no northern or western sun to enter its sacred precincts. Here grew a few Dicksonias, many having probably been removed in the course of years; the Cat-head Fern, *Aspidium aculeatum*, *Polypodium decompositum*, *Lomaria capense*, var. *procera*, and, strange to say, the one fern for which I had been looking for more than twenty years, during which time I had traversed many a more pretentious fern gully. Now, I trust you all, as lovers of Nature, not to give away the precise locality of this fern, for, as it is almost the only one of our indigenous ferns which has a monetary value among the nurserymen, I should not like to be the means of exterminating it from the district. The fern I refer to is the bipinnate form of *Lomaria discolor*. Perhaps fortunately, most of the specimens I saw were of too robust a type to stand removal, and as it is in such an out of the way place, I hope it may long remain there as one of the botanical features of the district. Portion of a frond exhibited will give you an idea of the character of the specimens. As it was getting late when we reached this spot, we did not quite complete the exploration of the gully, which could not extend for many hundred yards further, as we were now nearly up to the top of the Divide again. We therefore struck across to the road, and found ourselves about a mile from the school. Just opposite the school I went up on to a cleared hill, "The Bald Hill" of the Geological Survey map, which is a small area of Volcanic, in the midst of the granite, and probably the site of a small vent in earlier times.

On my return to Lancefield I was surprised to learn that, nearly 47 years before, the ill-starred Burke and Wills expedition had probably crossed the Dividing Range at the same spot as I had done that day. This seems to be a fact not generally known, and I have endeavoured, without success, by searching at the Public Library, to ascertain the reason for the expedition taking the road through Lancefield in preference to the Mt. Alexander road, through the Black Forest, the use of which route I had never questioned. My only conjecture is that Burke, having camels, adopted this route because it was less frequented, and offered better opportunities for camping. They certainly camped on the Deep Creek, about a mile north of the present township.

One of my principal reasons for accepting the invitation to visit Lancefield was the hope that an opportunity might occur to visit the well-known aboriginal stone quarries at Mt. William, and when my host offered to drive me out there the next day you may be sure I accepted his offer with pleasure.

These quarries have long been known to Victorian scientists, and some account of the place will be found in Mr. Brough Smyth's "Aboriginals of Victoria," but it had been almost forgotten till, in December last, the District Teachers' Association organized a great nature study outing there, when in a few hours the Lancefield folks learned more about their district than they had in as many years before.

Mt. William lies north-east of the township, and is reached by following the Pyalong road. Its height is not given on any of the official maps of Victoria, but, being a trig. station, I felt sure its height must be recorded somewhere. So on my return to town I applied to my friend Mr. Saxton, of the Lands Department plan room, for information on the point. He turned up an old survey plan, and found the height given as 2,689 feet—50 feet higher than Mt. Disappointment—and the name of the mount as "Williamson." Here, again, is a point for inquiry—when and why was the termination "son" dropped on our maps, and hence the confusion always likely to occur, when using the name Mt. William, as to whether the chief peak of the Grampians, near Ararat, or the Lancefield Mt. William is referred to. I believe Mr. Saxton, with his love for the origin of names, as evidenced in the interesting little book he has just published on Victorian place-names, is endeavouring to clear up the mystery.

So much for the name, now for the road thither. Crossing the Deep Creek about a mile east of where we crossed it the day before, the road trends north-easterly over poor Silurian country, with the rich cultivated slopes of the Mt. William Range rising sharply up on our right. We had heard a new find of Graptolites had recently been made in a quarry by the creek, but the person who knew of the locality was not at home when we called, so we drove on to where I learned one of our former members, Mr. E. E. Johnson, of Northcote, had purchased a homestead, and was about to settle down. He happened to be at home, and gladly availed himself of our invitation to join in our visit to the mount, as, being a recent arrival, he had not yet learned much about the district.

The road was fairly level hereabouts, and no one would imagine that we were just on the water parting between the streams flowing to the Murray and those to Port Phillip, and it was only by closely watching the signs of water action by the roadside that we decided that we crossed the divide at about 7½ miles from Lancefield. The Goldie State school was shortly afterwards passed, and then in about a mile we came to a cross road leading east along the northern base of Mt. William. Looking across the paddocks here, one wonders at the number of old houses and haystacks dotted about, but on getting nearer these turned out to be immense bosses of granite. Dozens of these could be seen in every direction.

After a short spell for lunch, and to tie up our horses, we started along the cross road mentioned, visiting several of the granite masses to see if they offered anything of interest, but, beyond *Kennedya monophylla*, and the ferns *Asplenium flabellifolium* and *Cheilanthes tenuifolia*, they were very barren. In about a mile we turned into the paddocks on our right, where there were signs of the solitary miner, and began to ascend the mountain slope. We had not gone far when our guide called attention to the flakes of stone lying about, and, sure enough there we were walking over ground which at one time was no doubt jealously guarded, and probably was the scene of many a fight, or even war, when the former dusky owners were assailed by tribes desirous of obtaining the coveted stone for their axes. To say that chips from the size of a threepenny piece to that of the palm of your hand could be picked up there by the ton is no exaggeration. I was fairly astounded at the scene. For how many hundreds of years did the aboriginals visit this hill to make their axes no one can tell, but the signs tell us that many generations must have passed away while these quarries were being used. Many axes of various sizes were picked up, but all rejects—*i.e.*, unfinished or thrown away for some defect—the reason being that the stones, after being roughly chipped to shape on the hillside, were taken away to some creek with running water to be ground down by patient rubbing on another stone. Of course, the aboriginals, having no iron tools, could not do any very extensive quarrying ; they had therefore to content themselves with using the rock where it outcropped, perhaps breaking it up somewhat by lighting fires on it and then quenching with cold water.

But what a busy scene it must have been when all these quarries, or rather chipping spots, were in full work. It is easy to see by the size of the chips where the finishing touches were put on a treasured axe-head, perhaps after days or weeks of patient chipping. In one place I noticed where a she-oak tree had been growing not far from an outcrop. Under the shelter of this tree was evidently a favourite chipping place, for a circular heap of chips extends fully five feet out from the trunk, and is nearly two feet thick ; this extends right round the tree. The tree, like the busy workers, has now perished. Could it but speak, what an interesting story it could tell ! The ferns mentioned before are doing their best to hide some of the heaps of chips, and present a very luxuriant growth. It is considered by some that the majority of the stone axes found in Riverina and northern Victoria came from Mt. William, though there were other manufactories in other parts of Victoria. The stone, as you can see by the specimens exhibited, is darker and finer grained than granite, and is usually termed diorite. The chips have a very clear ring when struck together.

Having had a good ramble over the quarries, we ascended the hill for the sake of the view, and presently found ourselves looking down on the town of Kilmore, about ten miles away to the east. The afternoon was closing in, and was not favourable for distant views, otherwise there should be a very fine panorama, extending from Mt. Alexander to the Strathbogies, and perhaps beyond. The top of the range is cultivated, and we did not get as far as the trig. station, which, even, is on private property. According to the parish plan of Goldie, in which it is situated, the trig. station is really a few chains north of the Divide, and is therefore in the county of Dalhousie, instead of Bourke.

I had long looked for Mt. William from Melbourne, but could never make up my mind as to its identity. Now I saw the reason. Being at the northern end of a range which runs north and south, and almost in a due north line from Melbourne, it is hidden from view, but I believe I picked it out the other day when at Kangaroo Ground. In closing, I may remark that on my suggestion Mt. William has been put down as the locality for a Club excursion in February next, and I think any member who takes part in the outing cannot fail to be both amazed and interested at the wonderful signs of primitive man's handiwork presented on the northern slope of the range. Whether there are other works in other parts of the range I cannot say, as we had not time to make much exploration. Perhaps the Club party will be able to add some further details to what I have told you to-night.

At the southern end of the range are the great loops of the unused Lancefield to Kilmore railway, which cost many thousands of pounds, and now lie awaiting a revival of that cross-country traffic, which seems long in coming.

Mount William, Lancefield.—Further reference to the ownership, &c., of the quarries on Mount William will be found in Dr. Howitt's work on "The Native Tribes of South-East Australia." He says the quarry belonged to the Wurunjerri tribe, which occupied virtually the whole of the country drained by the Yarra and its tributaries, but the immediate care of the quarry was entrusted to a family belonging to a subdivision of the tribe, whose headman, Billi-billeri, lived on the spot, and zealously guarded it against intrusion by tribes not entitled to make use of it. When neighbouring tribes wished for stone they sent a messenger to Billi-billeri saying that they would send goods in exchange for it, such as skin rugs. This man died in Melbourne in 1846, and was referred to by the Protector of the Aborigines as being "generous, frank, and determined, the white man's friend, and fostering all missionary and other exertions to better his race."

DESCRIPTION OF A NEW REMARKABLE CRUSTACEAN WITH PRIMITIVE MALACOSTRACAN CHARACTERS.

By O. A. Sayce.

(*Read before the Field Naturalists' Club of Victoria, 8th October*, 1907.)

The new crustacean, of which I now offer a preliminary description, is a very important one, having in a major degree the characters of the stalked-eyed forms, although possessing definitely sessile eyes, and also bearing other features which shed additional light on divergent groups. I consider it the most primitive sessile-eyed Malacostraca hitherto recorded. Its nearest ally is undoubtedly the stalk-eyed *Anaspides tasmaniæ*, G. M. Thomson.

It has been easy to separate crustaceans, apart from the more primitive forms, such as the Entomostraca, into two divisions—one, possessing movably stalked eyes, Podophthalma, and another, with sessile eyes, Edriophthalma—and hitherto there has been no sharp merging of one into the other. This basis for classification was adopted by Leach in 1815, and is to-day the generally accepted one.

For some years past, however, some few carcinologists, notably Prof. Boas, and later Dr. H. J. Hansen, have conceived that in certain circumstances this is not a natural classification, and that in the more primitive forms of each division—viz., the stalk-eyed Schizopoda and the sessile-eyed Isopoda—some of the former are more closely related to the latter than are some Schizopod families to each other. Hansen differs in many points from Boas, and no subsequent writer seems to have adopted their recommendations until recently, when Dr. W. T. Calman* has conformed to Hansen's suggestion (with some modifications and additions), and done away with the Schizopoda as a natural group, uniting some, the Euphausidacea, to the Decapoda (crayfish, crabs, &c.), and the remainder, the Mysidacea, to a large group including all the sessile-eyed forms (Isopoda and Amphipoda).

This is not the place to enter into a detailed discussion as to the systematic position of the present species, but I shall do so in another place, and give a detailed description, with illustrations of its anatomy. Sufficient to say here that it cannot be placed in Calman's division Syncarida, composed of the single order Anaspidacea, to which the present species is rather closely allied, without considerable alteration of his diagnosis; for instance, it has not all the thoracic somites distinct, the anterior one being coalesced with the head, the eyes are not pedunculated, nor are the thoracic limbs flexed between the fifth and sixth joints, but between the fourth and fifth. I can, however, respect his order Anaspidacea, so far undefined, and in consequence of the present species I offer a diagnosis of it.

* On the Classification of the Crustacea: Malacostraca. By W. T. Calman, D.Sc., Ann. & Mag. N. Hist. (7), xiii., p. 144 (1904).

Should the opinion preponderate that the Schizopoda, with the Euphausid and Mysid types both included, be kept for the present as a natural group, then Anaspidacea may be included as a tribe of that group.

I am aware in joining the present species to Anaspidacea that it originates an order possessing both stalked and sessile-eyed forms, but I feel confident that the close relationship shown in other respects of this new species to Anaspides warrants such a union.

Fundamentally the present species has the well-known Schizopod characters, and, of the two rather widely divergent types of that order, it has marked affinities with the Euphausid, and to a lesser degree with the Mysid type, as well as having a strong likeness to the primitive forms of Ipsoda and Amphipoda.

Considering the stalked eye as a primitive character, and dominant throughout the main stem of descent of the crustaceans, and the sessile-eyed forms as a lateral divergence, it appears to me that the present form is an early stage of such divergence.

It will not be disputed that the present species in general form and structure is like *Anaspides tasmaniæ*, G. M. Thomson, a noteworthy species in fresh-water pools on the summit of Mt. Wellington, Tasmania, and in Lake Field, situated 40 miles from the above situation, at an elevation of about 4,000 feet.

Anaspides differs from other Schizopods in possessing no vestige of a carapace, and has eight distinct thoracic somites. The present species has marked affinities with it, but differs in a good many minor characters and fundamentally in the eyes being sessile, there being no antennal scale, and in the coalescence of the first thoracic somite with the head.

The loss of stalked eyes, carapace, and scale-like exopodite on the antenna—each, I think, acknowledged as primitive features —while in most other respects quite of a Schizopod type, marks the present species as the most primitive sessile-eyed Malacostraca at present known, and it is no doubt a very ancient type. I may also note that Calman has shown that Anaspides closely resembles some of the oldest fossil Malacostraca (Uronectes, &c.)

Specimens were collected from small fresh-water reedy pools beside a tiny little runnel which joins the Mullum Mullum Creek, Ringwood, near Melbourne, during an excursion of the Nature Study Class for teachers, under the direction of Mr. J. A. Leach, M.Sc., to whom I am indebted for specimens.

Order.—ANASPIDACEA, Calman, 1904.

This order, so far, has not been defined.

Body generally slender, of nearly cylindrical form, integument thin. Carapace absent. Thoracic somites distinct, or with the anterior one fused with the head. Abdomen of about equal length to the cephalon and thorax combined, somites distinct,

flexing evenly throughout. Eyes stalked or sessile. Antennary scale small or absent. Auditory organ at base of first antennæ. Peduncle of second antennæ four-jointed. Mandibles without a secondary cutting edge (*lacinia mobilis* of Hansen). Maxillipeds and succeeding pairs of legs uniform in general structure, and adapted for walking. Swimming branches (exopods) on all but the last two or three pairs of legs. Branchiæ forming a double series on all but the last one or two pairs of legs, simple, lamellar, wholly uncovered. Pleopoda natatory, no *appendix interna*, inner branch (endopodite) rudimentary or wanting, except in the males, when it is modified in the two first pairs for sexual purposes. Telson and uropoda normal, together forming a "fan." No marsupial plates (oostegites).

Fam. 1.—Anaspidæ, Thomson, 1894.

Thorax of eight segments. Eyes pedunculated. Antennal scale arising from the second joint. Mandibles with single dentate cutting-edge, "spine-row" or setose ridge, and molar expansion. Maxillipeds with exopodite small, simple, and lamellar; epipodite quite small and simple, possessing also small gnatho-basic lobes on the inner face. First five pairs of legs with well-developed swimming branch. Branchiæ on all but the last pair of legs, which are without any appendages. Pleopoda with rudimentary endopodite.

Fam. 2.—Koonungidæ. Fam. nov.

In general appearance like Anaspidæ. Thorax with anterior segment fused with the head, leaving seven distinct subequal segments. Eyes sessile, no antennal scale, mandibles with a single dentate cutting-edge and molar expansion, no "spine-row" or its equivalent. Maxillipeds without any trace of gnatho-basic lobes, otherwise like Anaspidæ. Branchiæ and swimming branches of legs like Anaspidæ. Last pair of legs flexed in the opposite direction to the preceding ones. Pleopoda absolutely uniramus, except the first two pairs in the male.

Genus.—*Koonunga*. Gen. n.

Cephalon of about equal length to the following two segments combined, possessing a short transverse sulcus on each side at about the middle distance, posteriorly to which the margins are produced downward and inwards. Frontal margin of cephalon scarcely produced, incised above the attachment of the second antennæ, forming a small lateral lobe. Eyes small, round, situated on the dorsal surface at the angles formed by the union of the frontal margin and the incisions. Antennæ long and filamentous, the upper with basal joint of flagellum with sensory modification in the male, lower nearly as long as the upper.

Mandibles with a three-jointed palp. First maxillæ with a small but distinct palp. No swimming branch on the two last pairs of thoracic limbs.

Remarks.—The name is derived from the aboriginal name of a creek which runs near where specimens were collected.

Koonunga cursor, sp. n.

Specific Description.—Anterior portion of the body of subcylindric form, becoming gradually rather broader, deeper, and cylindrical posteriorly. All the segments of the thorax and abdomen subequal. Abdomen of equal length to the thorax, last segment not longer than the preceding one, with one or two dorsal spines close to the attachment of the telson. Telson entire, slightly broader than its length, of triangular form and rounded apex, margin fringed with a double or more series of stout spines. Uropoda with peduncle extending to half the length of the telson, its branches somewhat longer than the peduncle, inner one fringed along the inner margin with upturned spines, and three longer ones at the apex pointing outward; outer margin and apex fringed with very long feathered setæ; outer branch fringed with long feathered setæ, and the outer margin also with a row of upturned spines.

Mandibles each with a broad cutting plate, that of the left side curving outwards, and the edge divided into six stout teeth; that of the right side also broad, curved in the reverse direction, and the edge divided into five stout teeth; molar process similar in each, forming a well-extended broad ridge clothed with short, stout setæ, surrounding a minute triturating surface with chitinoid papillæ.

Maxillipeds rather stouter than the legs, extending directly forwards about as far as the distal end of the peduncle of the upper antennæ, the seventh joint (dactylus) minute, stout, and bearing four claws on the rounded extremity. The seventh joint, also, of each of the other limbs, minute, and bearing three long, stout claws, the middle one rather longer than the other two, which are positioned closely on each side of it and quite similar to each other.

Colour.—General appearance marbled dark brown. Microscopically showing a yellowish stratum, thickly dotted over with rounded areas composed of black granules.

Length.—Largest specimen measured 9 mm. (⅓-inch).

Occurrence.—From fresh-water reedy pools beside a tiny runnel joining the Mullum Mullum Creek, Ringwood, near Melbourne.

Remarks.—It is remarkably active; usual form of locomotion running, but can spring forcibly forwards, and also swim easily. It shuns strong light.

References.

G. M. Thomson—Description of a Remarkable Schizopod, Trans. Linn. Soc., Zool. (2), vi., 3.

W. T. Calman—On the Genus Anaspides, Trans. Roy. Soc. Edinburgh, xxxviii., pt. iv.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 18th November, 1907.

The president, Mr. G. A. Keartland, occupied the chair, and about 55 members and visitors were present.

REPORTS.

A report of the excursion to Wheeler's Hill on Saturday, 12th October, was given by Mr. F. G. A. Barnard, who reported an enjoyable outing. The locality had been chosen as much for its scenic attractions as for its natural history, and was reached by driving out from town (sixteen miles). The party numbered twenty-six, and was joined at Wheeler's Hill by six more. After viewing the landscape from the end of Waverley-road, the majority of the party rambled through the paddocks towards Gesner's Hotel, where all reassembled for tea. After tea a little time was spent in naming specimens, and then seats were resumed in the drag and a return made to town. The botanists had little to record for the day, flowers, owing to the unpropitious season, being very scarce, and only common species were seen. Some notes on the ornithological results were given by Mr. G. A. Keartland, who reported the finding of several nests, among them those of the Silver-eye, *Zosterops cœrulescens*, the Giant Kingfisher, *Dacelo gigas*, with three eggs, and the Yellow Robin. Great interest was evinced in watching, at short range, a Spotted Pardalote clearing the scale-insects, &c., off the leaves of a young sapling, and altogether a profitable afternoon was spent.

A report of the Club excursion to Melton on Saturday, 26th October, under the joint leadership of Messrs. G. A. Keartland and J. Gabriel, was read by Mr. G. A. Keartland, and some brief notes on the botanical results of the trip were furnished by Mr. F. G. A. Barnard.

An interesting report of the excursion to Werribee Gorge, which took place on Monday, 11th November, under the leadership of Mr. F. L. Billinghurst, was read by Mr. F. G. A. Barnard, who said that there was a good attendance of members, who made a very successful exploration of the Gorge.

A report of the juniors' excursion to Cheltenham on Saturday, 2nd November, under the leadership of Mr. C. French, jun., was submitted by the leader, the object of the trip being beetles.

Mr. T. S. Hall remarked on the poor attendance at some of the recent junior excursions, and urged members to assist as far

as possible in encouraging our young members to attend. He pointed out that the leaders frequently went to much trouble to make these trips as interesting as possible, and it was very discouraging to them to find so few availing themselves of such splendid opportunities to gain a knowledge of our commoner forms of animal and plant life.

The hon. librarian acknowledged the receipt of the following donations to the library :—" Report of Trustees Public Library, &c., Melbourne, for 1906," from the Trustees ; reprints of various papers by Prof. A. J. Ewart, D.Sc., Government Botanist, from the author ; " Notes on a Peculiar Habitat of a Chlorophyte," by A. D. Hardy, F.L.S. ; reprint from Journal Roy. Micro. Socy., from the author ; " Trees and Shrubs of Tasmanian Forests of Order Myrtaceæ," by L. Rodway, Government Botanist, from the Tasmanian Field Naturalists' Club ; *Journal of Agriculture of Victoria*, September, 1902, from the Department of Agriculture, Melbourne ; " Forest Flora of New South Wales," part 26, by J. H. Maiden, F.L.S., Government Botanist, from the author ; *Agricultural Gazette of New South Wales*, September, 1907, from the Secretary for Agriculture, Sydney ; *Nature Notes*, July and August, 1907, from the Selborne Society, London ; " Pond Life : Insects," by E. A. Butler, B.A., B.Sc. (purchased).

ELECTION OF MEMBERS.

On a ballot being taken, Mr. Herbert Johnson, 36 Rouse-street, Port Melbourne, was elected an ordinary member, and Masters E. Leyland and Allan Naylor, 53 Campbell-road, Upper Hawthorn, as associates of the Club.

GENERAL BUSINESS.

Mr. A. D. Hardy, F.L.S., moved—" That the invitation to members publishing new species or regional records at present affecting botanical workers only apply to all sections of natural history work of the Club, and that the notice be amended accordingly."

In speaking to the motion, Mr. Hardy thought that the recommendation to members to present to the Club a specimen of all plants recorded as new species or new to any part of the State, carried at a previous meeting, should equally apply to zoology. Such specimens would no doubt be appreciated by the National Museum, where they would be preserved and be available for future reference. The motion was seconded by Mr. F. G. A. Barnard.

Mr. T. S. Hall, M.A., explained that the object which Professor Ewart had in view in bringing forward the original proposal with regard to botanical specimens was to ensure the authenticity of records, and pointed out that while in botany there was no difficulty in obtaining duplicate examples of most of the plants,

the same could not be said regarding zoology. He was sure that the large majority of zoologists would be opposed to the proposal.

Both the president and Mr. J. A. Kershaw thought the motion unnecessary, and not likely to be carried out by the majority of members if adopted.

After the mover had replied, the motion was put to the meeting and declared lost.

PAPERS.

1. By Mr. A. J. North, C.M.Z.S., entitled, "Description of a new species of Chalcophaps from North-Western Australia."

This pigeon, to which the author has given the name of *Chalcophaps occidentalis*, was recently collected at Port Keats, N.W. Australia, and is allied to the well-known Little Green Pigeon, *C. chrysochlora*. It is distinguished by the lilac-mauve colour of the head, hind neck, and upper back, the more pronounced bronze colour of the wings, and the larger white shoulder-patch. The author proposes the vernacular name of "Lilac-mantled Pigeon" for the new species.

2. By Mr. A. J. North, C.M.Z.S., entitled "Note on *Paradisea granti*, North."

The author had been afforded an opportunity of examining a second specimen of this species, an adult male, obtained from German New Guinea, and added some further notes to his former description.

3. By Mr. J. R. Tovey, entitled "Remarks on the National Herbarium of Melbourne."

The author gave a brief history of the collections contained in the National Herbarium, commencing with the collection formed by the late Government Botanist, Baron F. von Mueller, prior to the year 1857. The various collections since obtained were enumerated, some of which are especially valuable from the fact that they include plants named by many well-known botanists, a list of whose names were quoted. The number of plants now in the Herbarium was estimated by the author at over one million.

The paper was discussed by Messrs. F. G. A. Barnard, G. Coghill, and A. D. Hardy, F.L.S., who expressed the hope that further notes regarding this valuable collection would be published.

NATURAL HISTORY NOTES.

The president, Mr. G. A. Keartland, said members would be interested to learn that a pair of Green-Leek or Barraband's Parrakeets, *Polytelis barrabandi*, Swains., had started to breed in his aviary. The female was now sitting on eggs. He stated that this is the first record of this species breeding in captivity in Australia, and he remarked that the female does all the sitting.

Mr. C. J. Gabriel, who was present for the first time since his

recent extended trip to Europe, was accorded a hearty welcome back by the members. Mr. J. H. Gatliff, in congratulating Mr. Gabriel on his safe return, said that the members looked forward to some good results from his observations regarding the conchological collections in the British Museum and other institutions, which he had had the opportunity of studying. The president, Mr. G. A. Keartland, endorsed the remarks made, and expressed the hope that Mr. Gabriel would see his way to give the Club the benefit of some of his observations at an early date.

Mr. Gabriel, in expressing his appreciation of the welcome accorded him, stated that he had given particular attention to natural history during his trip, and among other objects of interest had noted several of our Australian birds which were apparently thoroughly acclimatized and doing well in the London Zoological Gardens.

EXHIBITS.

By Mr. R. W. Armitage.—Small collection of insects from New Guinea.

By Mr. F. G. A. Barnard.—Striated stone from Werribee Gorge, and growing specimen of Native Beech, in pot, from Warburton, obtained April, 1906.

By Mr. H. J. Coles.—Nest, eggs, and male specimen of the Flame-breasted Robin, *Petræca phœnicea*, collected on Mt. Dandenong, 12th November, 1907.

By Mrs. A. D. Hardy.—Water-colour paintings of Australian wild flowers (chiefly Victorian), by Miss Henderson, of Kew, Victoria.

By Mr. G. A. Keartland.—Skin of Jardine's Campephaga, *Campephaga jardini*, and egg, from New South Wales.

By J. A. Kershaw, for National Museum.—Specimens of Weevils, *Desiantha premorsa*, Lea, found destroying tomato and cabbage plants near Melbourne, and among them were found several specimens of *Ethemaia sellata*, Pasc.

By Mr. D. M'Alpine.—"Horned" lemon, showing partial separation of the carpels; terminal and regular flower of foxglove in formalin, and foxglove plants showing terminal flowers more or less regular.

By Mr. Chas. Oke.—Insects collected on excursion to Werribee Gorge, 11th November, 1907.

After the usual conversazione the meeting terminated.

EXCURSION TO MELTON.

Although the previous day had been a very unpleasant one, with a strong wind blowing from the north, the weather on Saturday, 26th October, was perfect. A nice southerly breeze ushered in the morning, whilst thin clouds tempered the sun's

rays, consequently it was anticipated that we would have a good muster; nor were we disappointed, for our party numbered nineteen when gathered together on the Melton platform. We were pleased to welcome Mr. F. L. Billinghurst, who had come from Bacchus Marsh for his first outing with the Club, and Mr. J. A. Leach, M.Sc., who was accompanied by several nature study teachers from the Training College. Owing to the dryness of the season Melton looked its very worst. Mr. Raleigh, who has resided there for the past 45 years, declared that he had never seen it so dry before. Soon after leaving the railway station we crossed a number of paddocks in which the grass is usually knee-deep in October, and birds of many species to be seen on all sides—finches, &c., on the ground, insectivorous birds and honey-eaters in the trees; but on the 26th the ground was so bare that the hares and rabbits which are usually found there had all deserted the place. However, on crossing Mr. Morsley's farm, where numbers of Black-breasted Plovers, *Zonifer tricolor*, are usually met with, the warning notes of a pair of old birds were heard as they called their brood of four young ones away from our path. Brown Hawks, probably *H. berigora*, soared over-head, whilst Pipits, *Anthus australis*, ran over the ground but a few yards from us. After a call at Mr. Raleigh's farm, where a supply of milk and water for lunch was obtained, we were soon amongst the mallee scrub, although one very interesting place had been cleared off. Birds were scarce, but the Yellow-tufted Honey-eater, *Ptilotis auricomis*, was soon disturbed, and the notes of the Sooty Crow-Shrike, *Strepera fuliginosa*, heard. Whilst reducing the weight of our lunch bags near the creek, a pair of Black-faced Cuckoo-Shrikes, *Graucalus melanops*, passed over. A Bronzewing Pigeon, *Phaps chalcoptera*, was disturbed in the scrub. A short walk on the higher land brought us to a series of gullies where some mallee was just breaking into blossom. Here Pennant's Parrakeets, *Platycercus elegans*, and Rosellas, *P. eximius*, were disturbed, and some of the latter found dead on the ground—the result of eating rabbit poison. Whilst resting in the shade members with their field glasses had opportunities for watching quite a number of birds, including seven species of honey-eaters, three of robins, three cuckoos, and a host of others. The surprise of the day was the appearance of a pair of Bee-eaters, *Merops ornatus*, which perched on a dry tree, thus affording us a good view of them. This visit of these northern birds is probably due to the drought in their usual habitat. We have never heard of them being seen at Melton before. The party now scattered in various directions. Whilst some were searching for botanical specimens, others were in quest of pond life in a small water-hole in the creek. Several searched diligently for nests, without much success, except the finding of

scores of last season's. A few insects were secured. A short walk soon brought us to our starting point, and, after boiling the inevitable "billy," we followed the course of the creek for a short distance, and soon found nests of the Yellow-tufted Honey-eater and Yellow-rumped Tit within three feet of each other, both containing young ones. As this is a favourite nesting place of the Pardalotes, we soon discovered several of their holes, and whilst we were standing within a few feet of one the birds came with food for their family, and passed in and out of their burrow regardless of our presence. On one trip both birds were in the hole together. The depth of the hole was surprising, when the delicacy of the anatomy of the bird is considered. A thin twig about 20 inches long failed to reach the end of the tunnel. Although birds were very scarce, comparatively with what they usually are, we compiled a list of over 40 species, as follows :— Brown Hawk, White-backed Crow-Shrike, Sooty Crow-Shrike, Bronzewing Pigeon ; Pallid, Fantail, and Bronze Cuckoos ; Pennant's Parrakeets, Rosellas, Wattle-birds ; Spiny-cheeked, Yellow-tufted, Fuscous, Yellow-faced, New Holland, Spine-billed, and White-plumed Honey-eaters ; Blue Wren, Bee-eaters, Babblers ; Yellow-breasted, Hooded, and Scarlet-breasted Robins ; Yellow-tailed, Buff-rumped, and Lineated Acanthizas ; Black-faced Cuckoo-Shrike, Striated and Spotted Pardalotes, Black Fantail ; Restless, Brown, and White-shafted Flycatchers ; Welcome, Tree, and Wood Swallows ; Black-breasted Plover, Giant Kingfisher, White-throated and Rufous-breasted Thickheads, Pipits, Xerophilas, Brown Tree-creeper, Ravens, Harmonious Thrush, Spotted-sided and Red-browed Finches, Swallow Dicæum, and Stubble Quail.

Some notes on the other features of the excursion have been handed in by Mr. F. G. A. Barnard, who writes as follows :—

"Some half-dozen reports of excursions to Melton have been presented to this Club and published in the *Naturalist*, but all from an ornithologist's point of view, so on this occasion a few words about the botany of the district may be of interest. It was unfortunate that our visit was made during an abnormally dry season ; in fact, a farmer upon whom we called said there had been no rain for twelve months, and the country seemed to bear out his remark. The fact that a patch of 'mallee' occurs near Melton gives the locality some botanical interest, but as it takes a good botanist to distinguish the different species of eucalypts I am unable to say which species occur there. The only one seen in flower during the day was determined as *Eucalyptus melliodora*, one of the 'box' trees. As we crossed the paddocks towards the Djerriwarrh Creek—locally called Deep Creek, for shortness, I suppose—the first plant to attract our attention was the amaranth, *Ptilotus spathulatus*, with its curious flower spike,

known by the children as " pussies' tails." Presently a paddock, which should have been an oat crop, was gay with the delicate pink flowers of *Convolvulus erubescens*, set to catch all the morning sun. We now began to approach the clumps of "mallee," and along with them was a melaleuca, evidently *M. parviflora*, not yet in bloom ; this grows in large rounded bushes, or small trees, and when in flower is said to be a beautiful sight. A glance at the country showed that it was an interesting spot, and probably an extension of that singular tract of country, situated under the shadow of Mt. Bullengarook, and bounded on the west and east by the roads from Gisborne to Bacchus Marsh and Melton respectively. Some notes on this locality will be found in the *Naturalist* some years ago on the occasion of an excursion to Gisborne (*Vict. Nat.*, xvi., 146). *Myoporum deserti* and *Dodonœa viscosa* occurred here, the latter prominent from the highly coloured membranous expansions of its fruit. On the hillsides grew the Golden Wattle, *Acacia pycnantha*, and the Blackwood, *Acacia melanoxylon*. Crossing over a ridge, we got into the valley of the Djerriwarrh Creek, which in a normal season should be worth a botanist's while to explore. Soon we were attracted by a beautiful acacia in full bloom, which, on examination, proved to be *A. retinodes*. Another hillside covered with *A. acinacea* must have presented a pretty sight a few weeks before. *Nicotiana suaveolens*, *Goodenia ovata*, *Leptospermum lanigerum*, *Callistemon salignus*, with another acacia just over, probably *A. leprosa*, were fairly common. We then worked back to our starting point, and, after a rest, followed down stream for a while. Here large bushes of *Melaleuca parviflora* grew on the steep banks. *Mentha australis* was found in bloom, and on it the only buprestid beetle of the day was taken, *Stigmodera burchelli*—a rather common species, however. The smooth form of *Correa speciosa* grew on a rocky bank, while further along in a crevice of the rocks was a dried-up plant of the fern *Grammitis rutæfolia*. A number of insects were collected, but with the exception of one longicorn, undetermined, nothing of special rarity was seen. Some pond-life work was done in the quiet pools of the creek, but with what result I have not heard. Those who take an interest in variously shaped or coloured stones will find in the bed of this creek an inexhaustible supply, the result of water action on the Silurian rocks, and the locality is almost worth visiting from this point of view alone."

Notwithstanding the unfavourable season, it will be seen from the foregoing notes that though our collecting ground has been invaded by the dairyman, Melton still offers many opportunities to the field naturalist, and were the train facilities better would doubtless be more frequently visited.

G. A. Keartland ; J. Gabriel.

THE PLENTY RANGES IN EARLY SPRING.

By A. D. Hardy, F.L.S.

(*Read before the Field Naturalists' Club of Victoria, 9th Sept.*, 1907.)

The excursions of the Field Naturalists' Club are usually arranged for seasons in which the forms of life to be examined are most active and abundant. Botanical excursions, therefore, begin in August with short day or afternoon trips to the localities where lowland flowers make an early appearance. Thence forward till nearly midsummer the field for study of flowers, insects, and birds steadily widens. The highland—not necessarily alpine—flora receives more attention in late spring and summer, the plants of localities which have higher altitudes flowering, as a rule, much later than their lowland relatives.

An inquiry respecting the algæ of the Yan Yean Reservoir necessitated my visiting the northern sources of our metropolitan water supply on 24th, 25th June last, my companion being Mr. John Wilson, the Resident Inspector, who drove, and whose courtesy and patience seemed not in the least strained by the frequent halts called to enable one to dismount and identify or examine some wayside plants. Mr. Wilson's zealous care, for the Metropolitan Board of Works, of the flora of the watersheds is known to and gratefully acknowledged by all who have visited and become acquainted with the localities.

On two occasions excursions have been made to the Plenty Ranges by our Club—the first in December, 1892 (*Vict. Nat.*, ix., p. 145), and the second, extending over three days, in January, 1900 (*Vict. Nat.*, xvi., p. 163), when the late Mr. H. T. Tisdall, F.L.S., and Mr. Barnard collected during the outing the flowers of about 40 species. In addition to these reports, we have had exhibits of flowers from the country near the Cascades more than once at our wild flower exhibitions.

To the botanist the most interesting feature on the journey to Whittlesea, which is virtually the starting point for the Plenty Ranges, is the park-like appearance of the country around South Morang, where may be seen many fine examples of the Red Gum, *Eucalyptus rostrata.*

From Whittlesea onwards interest in the journey increases. Keeping northerly we reached an undulating tract, which introduced us to the steeper hills beyond. Settlement has spread over the southern portion of this intermediate area, and the transition from almost bare paddocks to evergreen sylvan country is rather abrupt. Indeed, it is a reminder of appeals made separately by this Club, the Surveyor-General (Mr. J. M. Reed, I.S.O.), and Professor A. J. Ewart, Government Botanist, for cessation of complete timber denudation and for the planting of trees. On one side we saw almost shadeless paddocks, in which some of the last vestiges of useful trees were indicated by

the still blazing or charred stumps and ash-heaps, and, on the other side, the beauty of a natural woodland. Whilst realizing the necessity for partial clearing to prepare for grazing, and in places total clearing for ploughing, one may ask, "Will the Victorian pioneer settler never realize that in the trees and shrubs, to which he so vigorously applies his axe and 'fire-stick,' he destroys many would-be friends to himself, his cattle, and his crops?"

Ingress to the water supply reserve is barred by a locked gate on the crest of a low spur, at the foot of which, on the northern side, is the small reservoir known as Toorourong. The reservoir covers about 30 acres, and receives the waters of Jack's Creek and the east branch of the Plenty River. These flow from the Dividing Range, the sources of some of the tributaries being in the gullies of Mt. Disappointment, a granite mass in the midst of and towering above the surrounding silurian. This is a very pretty spot at any season, and those who speak disappointedly of "the monotonous green of Australian gum-trees" should look across the sheltered, mirror-like surface of Toorourong in early spring, and see the wealth of colour—reds, greens, blues, and browns—of the delicate new foliage of several species of eucalyptus. In early spring, those who have eyes to see and do see may find almost every tone in the chromatic scale in the eucalyptus "scrub" of Victoria. Soon, indeed, much of this will have merged into more sombre hues, but not all; even the matured foliage of a young forest of eucalypts is, I contend, not monotonous.

In June annual herbs are not much in evidence, but on some poorly grassed parts innumerable earth-hugging rosettes of the "Bushman's Tonic," *Erythrea australis*, promised waves of pink to brighten the summer's landscape. Here and there the viscid, highly coloured rosettes of young Sundews, *Drosera Whittakeri*, &c., were already justifying their inclusion among carnivorous organisms.

In the reservoir the hollow, rush-like *Heleocharis sphacelata*, had not begun to show new shoots above the water, but these were found to be just bursting from the stout rhizomes in the mud at the bottom. The only other semi-aquatic macrophyte in the reservoir was *Juncus communis*, and from marginal clumps of this, and from last season's decayed shoots of Heleocharis I obtained some water samples for algological examination, the result of which may be referred to at another time. Though a number of green algæ were observed, the most plentiful microscopic plant in the reservoir was the zig-zag chain diatom, *Tabellaria flocculosa*, which was more plentiful than I had ever seen it before. It seemed to be most abundant amongst the rushes in a foot depth of water.

One does not expect much variety of avifauna in forest country. Birds, as a class, prefer partially cleared or naturally lightly timbered districts. On the reservoir a few Black Ducks, *Anas superciliosa*, and Cormorants, *Phalacrocorax gouldi*, were peacefully enjoying themselves, despite the fact that a Brown Hawk was gracefully circling overhead. There were no Swans, and on inquiry I learned that they have not been seen on that water. The following is a list of birds seen between Whittlesea and Toorourong :—Black-faced Cuckoo-Shrike, *Graucalus melanops*, White-backed Magpie, *Gymnorhina leuconota*, Noisy Minah, *Manorhina garrula*, Laughing Jackass, *Dacelo gigas*, Magpie-Lark, *Grallina picata*, Rosella, *Platycercus eximius*, White-eared Honey-eater, *Ptilotis leucotis*, Brush Wattle-bird, *Acanthochæra mellivora*, Crow or Raven, Scarlet-breasted Robin, *Petræca leggii*, and Brown Hawk, *Hieracidea orientalis*. This, even with the addition of a few others seen later, is a small number, and doubtless when the advancing season brings profusion of flowers and insects the count could be quadrupled, and correlative faunal and floral values assessed. June is yet too early for the floristic summons to the Mistletoe-bird, *Loranthus pendulus* having only young buds, but the presence at this early date of the Brush Wattle-bird reminds us that this honey-eater has fallen under suspicion as an agent for spreading the Mistletoe.

From Toorourong northerly for some miles the effect of bush fires was evident. At the time of a previous visit (1905) a fire had swept through a part of the forest land. Then the foliage of the tall trees had been killed and the blackened trunks gave little hope of revival. It was pleasing to note this spring that most of the large trees had abundant leafage in clumps on the old stems, in places much resembling gigantic Brussels Sprouts, and, notwithstanding, or perhaps because of the fact that not 10 per cent of the original shade was available, the undergrowth springing up in all directions was the beginning of another fine shrubbery. Professor Ewart has told us that "bush fires . . . . were probably frequent before the appearance of aboriginal mankind,"* and, with a scorched but recovering forest before us, we could readily accept his suggestion of an evolved fire-resisting habit saving these products of long growth from total destruction. There should be little doubt, I think, that mysterious forest fires are sometimes kindled by natural electrical agency. Possibly, too, the heat generated by friction of dead limbs and trunks grinding against each other during dry, hot weather is responsible for some of the outbreaks. The Metropolitan Board of Works, however, have increased the precautions with which they control

* "Tree Planting and Forest Preservation," by A. J. Ewart, D.Sc., &c., *Journal of Agriculture*, Vic., April, 1907, p. 227.

would-be picnickers, whose matches and lenticular ends of broken bottles are often the cause of disaster.

On the Plenty Ranges, as on the Black Spur (1905), I noticed what may be regarded as a sort of compensation for damage done by fire—viz., that where valuable timber is killed or spoiled a great deal of unornamental and almost uninteresting vegetation, together with much outlawed vermin, is blotted out completely, in many places the tangled undergrowth being replaced with thickets of ornamental and useful acacias of various species—the appearance of the Golden or Broad-leafed Wattle, *Acacia pycnantha*, some years ago on the northern face of the Black Spur being an example.

At Wombat Creek, more usually known as Smith's Gully, one may turn aside from the track to examine the natural fernery close at hand—a fernery through which comes much of the water consumed in the city. In June, the Valley Tree Fern, *Dicksonia antarctica*, and the Hill Tree Fern, *Alsophila australis*, had a little immature fruit on some fronds, but the rich red fruiting of *Osmunda barbara* had not commenced, nor were there any signs of sporing on the fronds of *Pteris aquilina*, while the Lomarias were in only vegetative condition.

Ascending the steep spur road which rises from Wombat Creek to the top of the range, many plants worth a second glance were passed in review, but most of them were not flowering, and many had not buds. Through gaps in the undergrowth, one caught sight of the tall Silver Wattles, *Acacia dealbata*, and Blackwoods, *A. melanoxylon*; nearer at hand were *A. verticillata*, twelve feet in height, and *A. linearis*, a little lower, both with young buds, while *A. juniperina* was already in bloom. It was too early for even the buds of *Cassinia aculeata*. Blooming and in plenty were *Correa speciosa* and *Epacris impressa*, the white form of the latter being conspicuous, but there was no sign of the red variety. *Cryptandra Hookeri* at a distance appeared like some other plant, with a profusion of nearly white flowers, the deception being created by the terminal light brown or creamy coloured spring foliage. On both sides of the track the scarlet flowers of *Grevillea alpina* were strongly in evidence. Equally plentiful was a shrub, which I took to be *Pultenæa daphnoides*. Later on this and several other leguminous shrubs would add very effectively to the colour scheme. Many smaller plants shelter among these, but of their number the only one in bloom was *Tetratheca ciliata* which in this locality has been reported in bloom as late as January. *Platylobium obtusangulum* had barely begun to bud, while of *Candollea serrulata* only dead plants of last season were frequent along the track. Later in the spring, the gem, perhaps, of all the flowers hereabouts, *Eriostemon corriefolius*, with its delicate lemon-coloured flowers, may be seen in great abundance.

After reaching the top of the spur—an elevation of 1,700 feet above sea level, or 904 feet above Toorourong—the road follows the water channel, and so gradually ascends to Wallaby Creek, and on to Silver Creek. From those streams and their tributaries, water diverted from the natural watershed of the Goulburn River is brought, by means of tunnels and quarried aqueducts, to fall on the southern side in artificial cascades, thence, by a timber chute, into the upper part of Jack's Creek. As we follow the contours of the mountain channel, the slopes ascend on the left towards Mt. Disappointment, some miles distant. This has an altitude of 2,637 feet, with a table-land below the summit on the northern side, and on our right steep declivities reach far down to King Parrot Creek. The bird, *Aprosmictus cyanopygius*, after which this creek was named was fairly plentiful in the valley about ten years ago, but, I was told, is now very scarce. Many residents of the lower valley have never seen a King Parrot, or King Lory, as it is alternately called. It may be remarked that occasionally a well-plumaged specimen will bring at least a pound in the city market.

From the head of the Cascades to Wallaby Creek the vegetation is not uniform. The undergrowth varies in composition, though the eucalypts of several species, including *E. amygdalina*, *E. globulus*, and *E. obliqua*, are constant. In places the Hill Tree Fern, *Alsophila australis*, and bracken hold sway ; in others young eucalyptus "scrub" monopolizes most of the space ; and again, in others, various plants occur in fair proportion in either of these groups. Before reaching Wallaby, one comes in contact with the highland flora. The Native Mulberry, *Hedycarya Cunninghami*, the Native Pepper Tree, *Drimys aromatica*, the Christmas Tree, *Prostanthera lasiantha*, the Blanketwood, *Senecio Bedfordi*, &c., become common, and several plants hitherto unnoticed are now conspicuous. Here the white variety of *Epacris impressa* was as plentiful as the red variety, but as we journeyed the reverse of the lowland conditions obtained, the red-flowering Epacris being here, there, and everywhere, while the white was absent. Whether this peculiarity was due to soil, altitude, season, or climate, I could not determine. The purple flowers of *Kennedya monophylla* appeared along the aqueduct, the plant trailing over the rocks, or, further back, twining up the saplings. A large yellow flower of a species of Senecio, probably *S. dryadeus*, blazed in lonely grandeur in occasional sheltered nooks by the wayside.

The line separating the silurian from the granite cuts across the track about a mile from Silver Creek, passing obliquely through the Nimmo Falls on Wallaby Creek to the right forward, the sedimentary rocks in the vicinity having been much hardened and crystallized by contact. Yet one does not see the corresponding

floral change which might be expected. This similarity of vegetation on dissimilar geological areas is probably due to the fact that, through the wearing down of Mt. Disappointment, the silurian is in many places deeply covered with the refuse from denudation of the granite heights, so that on the silurian slopes about the junction the soil has the same organic and inorganic constituents as the granite slopes above. The same rich ferruginous colour is through all.

The Golden Wattle, *Acacia pycnantha*, seems to show a disposition to modify its foliage as the altitude of the habitat increases. The highland plants, which are generally more symmetrical and handsome, have mostly dull bluish coloured and often more pointed phyllodes as compared with the shining and dark green phylloded plants of the lowland. This blue-grey "bloom," such as is found on plums, grapes, &c., was also seen to be more pronounced on *A. dealbata* than on that species at a lower altitude, and the appropriateness of the common name, Silver Wattle, is readily appreciated.

The foliage of *A. pycnantha* here and on other parts of the Dividing Range is much eaten by insects. I remember that in September, 1905, on the Black Spur, I searched over twenty trees for a single small branchlet with entire phyllodes, but failed, to such an extent had these trees been attacked. Here in June *A. pycnantha* was in bloom, but the development of the buds is slow, for in the report of the excursion in January, 1900, Mr. Barnard states this species was then already in bud.

Owing to an error in identification, *Acacia spinescens* is included in the report just referred to among the plants noted, but this, Mr. Barnard informs me, is a mistake, and the name *Amperea spartioides* should be substituted. Why Mr. Barnard in his notes spoke of the presence of the larger grass-tree, *Xanthorrhœa australis*, as indicating increased altitude is not clear, for in other parts of the State lowland areas vegetated largely by *X. australis* are at a very slight elevation above the sea, as at Point Lonsdale, Wilson's Promontory, Cape Otway, &c.

The best time of the year in which to see the plants of the Plenty Ranges in bloom would be during September and October for the north side and October and November for the southern slopes. Mr. Barnard's collection of thirty species, during two days' tramp in early October (*Vict. Nat.*, xiv., p. 99), at first sight suffers in comparison with the record of forty species collected or noted by Messrs. Barnard and Tisdall during three days in January, when presumably all seen were noted. But probably in his October collecting Mr. Barnard pursued his usual plan of bringing to the wild flower exhibition many specimens of a less than possible number of species, in order to have an effective exhibit, and only these species were recorded. Unless

it can be shown that the buds and blooms now recorded for June in this locality were phenomenally early, it will be seen that even by September much of the vernal beauty of this part of the country, or at least one phase of it, will have passed.

The early flowering of *Kennedya monophylla* and the acacias mentioned at an altitude where it might have been looked for later may be due partly to northern aspect and partly, perhaps, to the season being earlier this year. The former factor is, of course, a permanent one, but the latter can be valued only as reports from other districts come to hand during the coming months.

On a previous visit I saw a Lyre-bird at Wallaby Creek. They were probably plentiful at one time, as a tributary of the King Parrot bears the name Pheasant Creek, pheasant being a common bushman's name for the Lyre-bird, *Menura victoriæ*, Gld. I heard no Coachwhip-birds on this occasion, but about the highland area were Red Lories, *Platycercus elegans* (troublesome in the orchards of the valley when apples are about to ripen), a few Rosellas, *P. eximius*, and Black Jays, *Strepera cuneicaudata*, feeding on insects in the garden of the Hospice—in all fifteen species, as against thirty-three reported by Mr. Keartland for January, 1900.

Traces of Wombats were seen in many places; one stupid looking animal was almost run over by the buggy, a flick from the driver's whip failing to hurry it in the least. At the Hospice Mr Olney informed me that these animals are a great pest at times, and have to be destroyed, to prevent damage to the vegetable garden. An iron-bossed club and a much scarred and bitten bull-terrier were produced as evidence of many a *mêlee* close to the house. Among native plants one of the favourite foods of the Wombat is *Xerotes longifolia*. Of this the animal eats the tender leaves and the white underground parts of older foliage.

In conclusion, I endorse the opinion expressed in the report of the 1900 excursion, that the country lying between Toorourong and Mt. Disappointment should some day be examined by an excursion party. The going would be away from the beaten track, and, consequently, more difficult, but the information gained would probably compensate for the physical discomfort so endured.

The Caper Butterfly, *Belenois java*, Sparr.—For the second time this season this butterfly, formerly known as *Pieris teutonia*, Fab., was greatly in evidence about the city and suburbs on 30th November and 1st December. The questions arise where does it come from, and where does it go, and have the larvæ other food-plants than *Capparis Mitchelli*?

DESCRIPTION OF A NEW SPECIES OF CHALCOPHAPS FROM NORTH-WESTERN AUSTRALIA.*

By Alfred J. North, C.M.Z.S., &c., Ornithologist Australian Museum, Sydney.

(*Read before the Field Naturalists' Club of Victoria*, 18*th Nov.*, 1907.)

Mr. Edwin Ashby, of Blackwood, South Australia, has kindly sent me for examination some bird skins collected recently by Mr. C. E. May while at Port Keats, North-Western Australia. Among them are three adult specimens of a Chalcophaps, which may be distinguished from the Northern and Eastern Australian form as follows :—

Chalcophaps occidentalis, *sp. nov.*

Adult Male.—Head, sides of neck, hind-neck, and upper back lilac-mauve, slightly darker on the occiput; most of the lesser wing coverts white, forming a conspicuous shoulder-patch; remainder of the upper wing coverts, secondaries, scapulars, and centre of back rich bronze-green, the feathers on the upper portion of the latter margined with lilac-mauve; primaries brown, their inner webs for two-thirds of their length and the basal portion of the outer web of all except the three outermost chestnut-rufous; lower back dull blackish crossed with a light grey band, and followed by a slight darker and more indistinct band; rump and upper tail coverts grey with narrow blackish margins to most of the feathers and becoming broader on the longest upper tail coverts; two centre tail feathers brown, the remainder blackish, except the three outer ones which are grey crossed with a blackish subterminal band; chin, throat, fore-neck, breast, and abdomen a delicate lilac-mauve, the feathers on the centre of the chin and upper throat with small pale buffy bases forming an indistinct central streak; the feathers on the abdomen with a greyish shade and those on the lower flanks washed with brown around their tips; basal under tail coverts grey, the remainder blackish. Total length 10.5 inches, wing 6.2, tail 3.8, bill 0.7, tarsus 1.

Adult Female.—Differs from the male in being duller in plumage except on the wings, in having only an irregular-shaped dull white bar on the lesser wing coverts, a more pronounced grey bar below the lower back, and the upper tail coverts dull chocolate-brown, but with similar blackish margins; tail feathers chocolate-brown all but the central pair, with a blackish terminal band, the outermost one on either side grey, with a black subterminal band. Wing 6.2 inches.

Habitat.—North-Western Australia.

Remarks.—Another adult male has the bronze colour on the

* Contributions from the Australian Museum, by permission of the Trustees.

wings more pronounced than in the specimen described above, and also has the centres of the blackish feathers on the lower back dull bronze. This species is allied to the well-known *Chalcophaps chrysochlora*, from which it may be distinguished by the lilac-mauve colour of the head, hind-neck, and upper back, the more pronounced bronze colour of the wings, and the larger white shoulder-patch.

Gould's vernacular name of Little Green Pigeon for *Chalcophaps chrysochlora* is not quite correct, for its wings only are green. It would also be incorrect to call *Chalcophaps occidentalis* the Western Green-winged Pigeon, for its wings are more of a bronze colour than green ; I purpose, therefore, to distinguish it vernacularly by the name of the Lilac-mantled Pigeon.

NOTE ON GRANT'S BIRD OF PARADISE, *PARADISEA GRANTI*, North.

By Alfred J. North, C.M.Z.S., Ornithologist Australian Museum, Sydney.

(*Read before the Field Naturalists' Club of Victoria, 18th Nov.*, 1907.)

A second specimen of *Paradisea granti*, orginally described by me in the *Victorian Naturalist*,* has recently been lent me for examination. Like the type, it is a native-prepared skin, and was obtained, Mr. Grant informs me, at one of the German New Guinea ports (probably Frederick-Wilhelmshafen).

The skin is that of a fine old adult male, exhibiting the characteristic reddish-orange-coloured flank plumes of the type, but the metallic-green feathers extend lower down the throat, almost meeting the rich vinous-brown, velvety plumage of the fore-neck and upper breast. The latter, too, are longer, which is probably due to age, as is also the greater extent of metallic-green feathers on the throat; found also in very old birds of *Paradisea raggiana.*

Grant's Bird of Paradise is a very distinct species, and may be easily distinguished by its reddish-orange flank plumes. It is anticipated that a specimen will shortly be forwarded to London, to be figured.

"From Range to Sea" is the title of a charming series of essays from the pen of Mr. Charles Barrett, dealing mainly with bird-life, which have the advantage of being daintily illustrated with pictures, mostly from the camera of Mr. A. H. E. Mattingley. The little volume is well printed, and should be in every nature lover's collection.

* *Vict. Nat.*, vol. xxii., p. 156, January, 1906.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 9th December, 1907.

The president, Mr. G. A. Keartland, occupied the chair, and about 50 members and visitors were present.

CORRESPONDENCE.

From the hon. sec. of the Tasmanian Field Naturalists' Club, inviting the Club to join them in a trip to Flinders Island, Bass Strait, during Easter, 1908. It was proposed to charter a steamer, which would leave Launceston on the Good Friday, returning on the following Tuesday.

The proposal was not supported by the members, who were more inclined to devote the time to research work nearer home, where so much has still to be accomplished.

EXCURSIONS.

A report of the excursion to Frankston on Saturday, 23rd November, was read by the leader, Professor A. J. Ewart, D.Sc., Ph.D., who said that there had been a good attendance, and that a number of interesting plants had been found and observations made during the afternoon.

A report of the junior excursion to Hampton, on Saturday, 7th December, was submitted by Miss F. Bage, M.Sc., who reported a fair attendance of juniors, and, notwithstanding a high tide, a large number of interesting objects were examined.

ELECTION OF MEMBERS.

On a ballot being taken, Mr. W. R. Bennetts, Princess-street, Kew, and Mr. Percival F. Hosking, 107 Elgin-street, Carlton, were elected as ordinary members; and Masters Rowland Le Souëf, "Brockley," Hotham-street, East St. Kilda, and Edward Scott, 16 Pakington-street, Kew, as junior members of the Club.

GENERAL BUSINESS.

Mr. G. A. Keartland, who with Professor A. J. Ewart, D.Sc., Ph.D., was appointed by the committee to represent the Club at a conference of the various Victorian scientific societies and institutions, convened by the Director of the National Museum, Professor Baldwin Spencer, C.M.G., F.R.S., to consider the question of the permanent reservation of Wilson's Promontory as a National Park, &c., reported that a meeting was held at the Melbourne Public Library on Friday, 29th November, when Professor Baldwin Spencer was appointed chairman, and Mr. J. C. Kershaw, F.E.S., hon. secretary.

The whole matter was carefully considered, and it was decided to ask the Government—(1) To reserve permanently the whole of Wilson's Promontory as a National Park for Victoria; (2) to vest the National Park in trustees; (3) to appoint a ranger to act as custodian of the National Park; (4) to request the Hon. the Minister of Lands to receive a deputation on the subject.

Matters relating to the *Fisheries and Game Acts* were also considered at the conference, and a committee was formed, to which all questions relating to the *Fisheries and Game Acts*, or dealing with the Australian fauna and flora generally, could be referred for report.

The committee was composed of the representatives appointed by the various scientific societies and institutions interested. It was decided to ask the Government to recognize this committee, and an executive was appointed, consisting of Professor Baldwin Spencer, C.M.G., F.R.S., Mr. J. A. Kershaw, F.E.S., and Mr. A. H. E. Mattingley, which would deal with all matters as they were received.

Mr. A. H. E. Mattingley drew attention to the fact that Mr. Robert Hall, C.M.Z.S., who was present, would shortly be leaving the State to take up the position of Curator of the Tasmanian Museum, Hobart, and thought that members would like to take this opportunity to wish Mr. Hall every success in his new sphere. Mr. Hall was an old member of the Club, and had accomplished much useful work during the many years he had been with us. The president endorsed Mr. Mattingley's remarks, and said he joined heartily in wishing Mr. Hall prosperity in his future work. Mr. Hall thanked the members for their kind expressions for his future success, and in the course of his remarks expressed his appreciation of the many benefits he had received while a member of the Club.

PAPERS.

1. By Mr. D. M'Alpine, entitled—"The Specific Name of the Introduced Plant known as 'Onion Weed.'"

The author said that, not being satisfied with the generally accepted name, *Romulea bulbocodium*, Sebast. and Mauri, for this plant (Mueller, "Key to System of Victorian Plants"), and bearing in mind the recent diagnosis of it as *R. cruciata*, Ker-Gawl, by Prof. Ewart (*Journal of Agriculture of Victoria*, Sept., 1907), he had forwarded well-selected specimens of the plant in different stages to the Royal Gardens, Kew, England, and had received from the Director the identification *Romulea rosea*, Echl., which species, however, the Director says is probably conspecific with *R. bulbocodium*.

In reply, Prof. Ewart said that Baron von Mueller appeared to have never been really certain as to the proper name

for Onion Grass (Pink Star), and finally reference was made to Europe, and the name changed from *Romulea bulbocodium* to *R. rosea*. On referring to the same sources, Mr. M'Alpine has naturally obtained the same identification, which is an approach to the truth, but not the whole truth. Our plant always has the style shorter than the stamens (self-pollination), and this form was distinguished as *R.* (*Trichonema*) *cruciata* by Ker-Gawl. The section of the leaf also differs from that of *R. rosea*, and still more from that of *R. bulbocodium*. Finally, the flower of *R. rosea* is much larger than that of *R. cruciata*. The statement that the length of the style is very variable does not apply to the Australian *R. cruciata*. It is remarkably constant, and it is absurd to refer on a point of this kind to Europe, where the plant does not grow, and where only scanty herbarium material is available. A point of this kind can only be settled by continued field observations in Australia or South Africa. Those interested in the matter may see the true *R. rosea* growing in the Botanical Gardens, and compare it with the wild *R. cruciata*.

Mr. F. R. Godfrey said that personally he was more concerned with the manner in which this weed could be successfully got rid of than as to which name was the correct one. He became acquainted with the plant in the Royal Park, where the ground was covered with it, and stated that it had been successfully eradicated by the frequent ploughing and cutting up of the ground and leaving the roots exposed to the sun.

2. By Professor A. J. Ewart, D.Sc., Ph.D., entitled—"Some Notes on Field Work."

The author pointed out that much more might be made of many of the Club excursions than is really done. With reference to botany, many points interesting especially to the beginner are overlooked. Taking the leaf for instance, the reasons for the different characters of leaves might be readily demonstrated on some of our common plants. Then, again, the relations of leaves to light, the daily variation movements of leaves, in some cases very rapid, in response to intense light, such as direct sunlight, and to darkness could be easily observed.

The paper was discussed by Messrs. D. M'Alpine, C. French, jun., H. J. Coles, T. S. Hall, M.A., and the president.

NATURAL HISTORY NOTE.

Mr. C. J. Gabriel drew attention to his exhibit of wild flowers from Switzerland.

EXHIBITS.

By Mr. R. W. Armitage.—Small case of insects (Lepidoptera and Coleoptera) from N. Queensland. Nest and two eggs of Sunbird, *Cinnyris frenata*, S. Müll.; the nest was found hanging

from a cord under the verandah of the A.U.S.N Company's office at Cooktown, N. Queensland. Two living lizards, *Tympanocryptis lineata*, captured at Fishermen's Bend, 10th October, 1907.

By Mr. H. J. Coles.—Square-tailed Cuckoo, male, from Ringwood, 30/11/07. Living orchid, from Blackall Ranges, Queensland. When collected, August, 1904, there were only two leaves on each stem; in 1905 and 1906 there were three leaves, and in 1907 four leaves to each stem. The specimen has been growing in the open.

By Mr. C. F. Cole.—Nest of White-plumed Honey-eater, *Ptilotis penicillata*, Gld., showing an egg of the Pallid Cuckoo, *Cuculus pallidus*, Lath., woven in near the outside of the bottom of the nest. This egg was doubtless deposited by the cuckoo before the nest had been completed, and had been built over. Collected at Auburn, 7/12/07. Also, specimens of Rose-crowned Fruit-Pigeon, *Ptilopus ewingii*, Gld., and the Red-backed Wren, *Malurus dorsalis*, Lew., from Queensland; and the Bell Minah, *Manorhina melanophrys*, Lath., from Beaconsfield, Victoria.

By Mr. J. E. Dixon.—Victorian Coleoptera collected recently, including *Stigmodera thompsoni*, *S. longula*, and *S. andersoni*; *Diadosus erythrurus*, *Iotherium metallicum*, and *Uracanthus bivitta*.

By Mr. C. French, jun.—Specimens of the Mud-skipper or Climbing Fish, *Periophthalmus koelreuteri*, from Cooktown, Queensland.

By Mr. J. Gabriel.—Two specimens of coral, *Plesiastrea urvillei*, dredged in Hobson's Bay, 11/07.

By Mr. C. J. Gabriel.—Wild flowers from Switzerland collected by himself; also marine shells, *Pecten keppelliana*, Sow., Cape Verde Island, and *P. sinensis*, Sow., China, and a series of thirteen species of the genus Chlamys, from various parts of the world.

By Mr. A. H. E. Mattingley.—Abnormal white eggs of Emu, *Dromœus novæ-hollandiæ*, taken at Narrabri, N.S.W.

After the usual conversazione the meeting terminated.

We are pleased to record that the Trustees of the National Museum have purchased the Australian Palæontological collection of the late Mr. John Dennant, F.G.S., F.C.S., the results of whose work among the fossils of Muddy Creek and other localities are well known. The collection embraces the "types" of the fossil corals described and figured by him, while the greater part of the remainder is especially valuable from the fact that it has been named by the late Professor Ralph Tate, F.L.S., F.G.S., whose work in this branch of science is so widely known. The Trustees of the Museum are to be congratulated on their acquisition of this important collection.

EXCURSION TO WERRIBEE GORGE.

It is exactly twenty years since this Club made its first excursion to the Bacchus Marsh district, to which the railway had just been opened. Then the Werribee Gorge was known only as a rugged, picturesque spot, and as such it still remains. A few years later a then member of this Club, Mr. C. C. Brittlebank, took up his residence in the vicinity, and soon found it was a good locality for birds, so in October, 1890, an ornithological excursion was made by a small party of members, and fifty species of birds recorded. Later, in the course of his rambles, Mr. Brittlebank endorsed certain opinions regarding the geology which have made the Gorge famous, and therefore I think this Club can fairly claim to have had some hand in giving it the prominence, as a suitable locality for nature study, that it now enjoys. On our first excursion, briefly referred to in the *Naturalist* for December, 1887 (*V. N.*, iv., 114), we reached only as far as the entrance to the Gorge. The next excursions, in October, 1890, and October, 1891, were for ornithology, but on the occasion of the last-mentioned trip the geology was also examined, and the supposed evidences of glacial action found by Mr. Brittlebank were confirmed by one of the party, Mr. G. Sweet, F.G.S., and these two members contributed a joint paper on the subject to the Adelaide meeting of the Australasian Association for the Advancement of Science in September, 1893 (Proc. A.A.A.S., v., p. 136). In April, 1894, and November, 1894 (*Vict. Nat.*, xi., 54 and 125), excursion parties again visited the Gorge, and studied the geology under Mr. Brittlebank. No further excursion was made by this Club until Monday, 11th November (King's Birthday), when sixteen members and friends, including six ladies, left town by the morning train, and, after a tedious journey, reached Bacchus Marsh an hour and a half late ; here they found the leader for the day, Mr. F. L. Billinghurst, anxiously awaiting their arrival. He had previously suggested hiring a conveyance to take the party some distance on the way, and the plan was a wise one, for we were saved some 3½ miles of rough walking on a rather hot morning. Our road led along the southern side of the Werribee, and ended close under the steep hillside on top of which is the railway to Ballarat. About a mile from where we left the vehicle the entrance to the Gorge came in sight, and it was necessary to cross the river. Fortunately there was little water in the stream, and, as there is a superabundance of stones, this was easily accomplished. Close by a fine Black Wattle, *Acacia mollissima*, was in full bloom, and filled the air with its delicate perfume. A little further along, the glacial till, full of stones of all sizes and shapes, was disclosed in a small section. Hereabouts the bright yellow-rayed florets of *Senecio spathulatus* attracted our attention; another member of the genus, *S. odoratus*, was conspicuous on

account of its ample bluish-green serrated leaves, while yet another species, *S. lautus*, with very much incised leaves, grew close by. Everywhere grew the Parsley or Carrot Fern, *Cheilanthes tenuifolia*, while in the crevices of the rocks were plants of the Rat-tailed Fern, *Asplenium flabellifolium*. After proceeding as far as a small fall in the stream our leader, owing to a previous engagement, had to return to Bacchus Marsh, and it fell to my lot to act as pilot until we should meet the deputy leader, Mr. T. Brittlebank. As it was now past mid-day, it was decided to lunch before proceeding further. After lunch the majority of the party proceeded up the Gorge, picking their way as best they could amongst the loose stones, and dodging the thorny branches of the Tree Violet, *Hymenanthera Banksii*, laden with fruit just beginning to show a purple tinge. Presently a huge anticlinal fold in the rocks came into view on the southern side, then the stream had to be crossed a couple of times, when, on rounding a corner, we met Messrs. C. C. Brittlebank and Gray. The former apologized for his brother's absence owing to illness, and offered to take up the leading for a time. Considering that Mr. Brittlebank knew every inch of the country round about, such an offer was not to be refused, and it was decided to work a little further up the stream and then ascend a less precipitous part of the northern bank, so as to get a general view of the Gorge from the top. We were then in a most romantic spot, standing at the foot of a rocky face just over 600 feet in height, with another similar scarp not far ahead. Shortly afterwards we met Mr. G. B. Pritchard with a party of students from the Working Men's College, and he kindly paused for a few minutes to add some further geological information to our store. Soon after parting we came to the place for ascending, and started up a slope with a fairly steep grade. This tried our climbing powers, but, taking it quietly, and with a rest now and again, we safely reached the top. During one of the spells a stray specimen of *Pterostylis rufa* was picked, and at the top *Brachyloma daphnoides*, a small shrub very like a Styphelia, was in bloom. We now made towards the edge of the Gorge, where there is a fine growth of Golden Wattle ; here we found another member resting after an arduous day's beetle-hunting, for which he was rewarded by the capture of a rather rare longicorn. Here our leader pointed out the features of the landscape, and we soon forgot our stiff climb as we beheld the wonders of the Gorge spread out below us. Traversing the bank to another outlying hill we got a fine view back to Bacchus Marsh, with Melbourne in the distance. Here our second guide left us, and we made our way down the hill to the crossing place of the morning. Down this slope striated stones are to be picked up, and all were soon provided with specimens more or less weighty. Another mile brought us to

our vehicle, and in half an hour we were back at the station ready for a cup of tea and a sandwich. Leaving at 7 p.m., after a weary journey town was reached at 9.30 p.m.

I am indebted to two new members, Messrs. G. Anderson and C. Oke, for reports on the birds and insects seen. Neither contain any very striking records. Mr. Anderson, however, adds four birds to the list given by Mr. A. J. Campbell sixteen years ago. He reports having seen the Brown Hawk, Kestrel, Great Brown Kingfisher (Laughing Jackass), White-backed Magpie, White-fronted Heron, Magpie-Lark, White-throated Tree-creeper, White-fronted Chat, Fire-tailed Finch, Red-eyebrowed Finch, Swallow Dicæum, White-throated Honey-eater, Yellow-tufted Honey-eater, Rufous Thickhead, White-throated Thickhead, Rosella Parrot, Pennant Parrakeet, Black and White Fantail, White-shafted Fantail, Silver-eye, Blue Wren, Scarlet-breasted Robin, Harmonious Thrush, and Welcome Swallow.

Mr. C. Oke says :—"Insects generally were scarce, and nothing of special note was seen. For the identification of many of the specimens I am indebted to the National Museum authorities. On a few branches of Leptospermum, which were in flower, a small species of Mordella was very plentiful, also *Attractus ruficollis*, *Stigmatium gilberti*, *Stigmodera burchelli*, *S. cyanicollis*, *S. stephensi*, *Pempsamacra dispersa*, and *Stenoderus suturalis*. On the black wattles, which were in full bloom, *Eleale pulchra*, *Stigmodera burchelli* (very plentiful), *Cisseis acuducta*, *C. semiscabrosa*, *Pempsamacra vestita*, *Syllitus grammicus*, *Belus brunneus*, *B. filum*, *Paropsis liturata*, and two small species of Cleridæ were obtained. The Pumpkin Beetle, *Aulacophora hilaris*, was very numerous flying over the scrub in the Gorge. The only butterflies I noticed were a few small 'blues' and the Painted Lady, *Pyrameis kershawi*. On the dried-up remains of a Vulpine Phalanger two species of Saprinus and the larvæ of a carab beetle were noticed, and as *Ceneus chalybeipennis* was found on the ground under a piece of bark, probably the larvæ were of that species. *Perperus insularis* and *Pempsamacra dispersa* were obtained on a flowering eucalyptus, while on some small acacias *Goniptera exaratus*, *Rhinotia dermestiventris*, *Belus brunneus* (?), two species of Paropsis and *Australica barloni* were secured, the latter being very numerous."

Beyond the plants already mentioned there are few others to record. Doubtless, owing to the dry season, flowering plants were scarce. However, *Callistemon salignus*, *Solanum vescum*, *Nicotiana suaveolens*, and *Leptospermum scoparium* may be added to the list.

Reprints of a map of the Gorge, which appeared in the *Naturalist* of July, 1901, were distributed to the party, and greatly helped in understanding the geography of the locality.

It is pleasing to be able to state that at last the Gorge, mainly through the exertions of Mr. F. L. Billinghurst, has been recognized by the people of Bacchus Marsh as a valuable asset of their district; and as the Minister of Lands has promised to supplement the sum raised by them for making an easier approach to this remarkable spot, which it is intended to proclaim a National Park, it is hoped that the work will be taken in hand at an early date. It is also proposed to make a good track well into the Gorge, and to show the interest of this Club in the matter, your committee has voted a donation of two guineas to the Improvement Fund.—F. G. A. Barnard.

VICTORIAN PLANT RECORDS.

By Alfred J. Ewart, D.Sc., Ph.D., F.L.S.

(*Read before the Field Naturalists' Club of Victoria, 8th Oct.*, 1907.)

In a previous short note it was pointed out that a large amount of erroneous or unnecessary recording of native plants as new to Victoria had taken place, and in the present paper similar instances are included in regard to naturalized introduced plants. The chief sources of information in regard to naturalized plants are Bentham's "Flora," Mueller's "Key to Victorian Plants," and a list published by Reader in the *Journal of Pharmacy* for 1887. In the case of the two latter lists former records are naturally included, although unfortunately without any record of their origin, so that it is difficult to distinguish the new from the old. In many cases, however, what purport to be new records of plants as naturalized have appeared in the *Victorian Naturalist*, although older records recognizing the plants in question as definitely naturalized were extant. Such duplicate recording is naturally apt to cause confusion, and hence a comprehensive list is in preparation, giving the earliest record for each introduced plant as naturalized. In the meantime a list is given of duplicate or erroneous records, so that these can be omitted in most cases at least from the final list. A few erroneous records are due to wrong naming, and this has in some cases caused an introduced plant not to be recognized as such. Thus *Bromus madritensis*, L., was correctly recorded by Mr. Reader as a naturalized introduced plant in the *Vict. Nat.*, vol. xix., p. 124, but a specimen of it received from Mr. Walter (Wimmera, 1887) was labelled *Aristida Behriana*, F. v. M., a native grass to which it bears an external resemblance, and with which it appears to have been largely confused. Again, *Agrostis alba*, L., recorded as native in Benth., Fl., vol. vii., p. 576, 1878, has been recorded as naturalized in the *Journal of Pharmacy*, 1887, and in the *Vict. Nat.*, vol. xxii., p. 79, 1905, while *Spergularia media*, *Vict. Nat.*, vol. xiii., p. 103,

1896, is the native *Spergularia rubra*, L. *Camelina dentata*, Pers., *Vict. Nat.*, vol. xx., p. 133, 1904, is an error in identification for *C. sativa*, Crantz, not previously recorded. In the following list the first record follows the plant, and the second record of the plant as a new naturalized introduction follows subsequently. The curious may find the authors responsible by looking up the quotations given.

Anthemis arvensis, L., *Journ. Pharm.*, 1887 ; *Vict. Nat.*, x., 145, 1893.

Bellis perennis, L., *Vict. Nat.*, xix., 50, 1902 ; *Vict. Nat.*, xix., 104, 1902.

Convolvulus arvensis, L., *Vict. Nat.*, x., 145, 1893 ; *Vict. Nat.*, xxiv., 15, 1907.

Echium violaceum, L., Benth., Fl., iv., 385, 1869 ; *Vict. Nat.*, x., 145, 1893.

Galium murale, All., *Journ. Pharm.*, 1887 ; *Vict. Nat.*, xiii., 71, 1896.

Medicago maculata, Willd., *Journ. Pharm.*, 1887 ; *Vict. Nat.*, xxiv., 15, 1907, also as *M. arabica*, *Vict. Nat.*, x., 145, 1893.

Oxalis grandiflora, Jacq., *Journ. Pharm.*, 1887 ; *Vict. Nat.*, xxiii., 100, 1906.

Polypogon Monspeliensis, Desf., Benth. Fl., vii., 547, 1878; Key, 1887–1888 ; *Journ. of Pharmacy*, 1887 ; *Vict. Nat.* x., 145, 1893.

Papaver hybridum, L., Key 1887–1888 ; *Vict. Nat.*, x., 144, 1893.

Stachys arvensis, L., Benth., Fl., v., 73, 1870 ; *Journ. Pharm.*, 1887 ; *Vict., Nat.*, x., 145, 1893.

Soliva sessilis, Ruiz and Pav., *Vict. Nat.*, x., 157, 1894 ; *Vict. Nat.*, xix., 71 and 104, 1902.

Senecio elegans, L., *Vict. Nat.*, xxii., 79, 1905 ; *Vict. Nat.*, xxiv., 16, 1907.

Scandix pecten-veneris, L., *Journ. Pharm.*, 1887 ; *Vict. Nat.*, xxiv., 16, 1907.

Saponaria vaccaria, L., Key, 1887–1888; *Vict. Nat.*, x., 145, 1893.

Salvia verbenacea, L., Benth., Fl., v., 86, 1870 ; *Vict. Nat.*, x., 145, 1893.

Trifolium parviflorum, Ehr., *Vict. Nat.*, xx., 49, 1903 ; *Vict. Nat.*, xxiv., 16, 1907.

Verbena bonariensis, L., *Journ. Pharm.*, 1887 ; *Vict. Nat.*, x., 145, 1893.

In those cases in which we ourselves are responsible for the repetition of a previous record, this was due to the absence of any definite herbarium records or specimens, which again was the natural result of the lack of co-ordination prevailing between the

botanists of Victoria during the past ten or more years. The publication of this list forms one acknowledgment of the prior record in such cases, but botanical records should be published in botanical or biological journals recognized as of scientific value, and not scattered in pharmaceutical or medical journals, where they are lost among a host of foreign matter. The existence of some of these records was not known at the Herbarium until quite recently.

REMARKS ON THE NATIONAL HERBARIUM OF MELBOURNE.

By J. R. Tovey (First Assistant, National Herbarium).

(*Read before the Field Naturalists' Club of Victoria, 18th Nov.*, 1907.)

In the year 1857 a large building was erected in the Government House Domain for the reception of the botanical specimens accumulated by the then Government Botanist, Baron Ferdinand von Mueller. He also donated, as a free gift, his private collection formed by him since 1840, and incorporated it in the Government collections, thus forming a very valuable herbarium. Through interchanges and geographical expeditions and by the purchase of the herbariums of the late Dr. Sonder, of Hamburg, Mr. F. M. Reader, Rev. Mr. Wilson, and others, these collections have become so much enriched that the sheets containing pressed and dried plants can now be estimated at over a million.

The Melbourne Herbarium thus ranks among the larger herbariums of the world, while it far exceeds any other in its richness of Australian specific forms. In these are included the specimens examined by Bentham when preparing the "*Flora Australiensis*," and the type specimens of Mueller's numerous species. A collection such as this, is therefore of the highest value in tracing geographic, regional, and geological distribution as well as the range of variation in any given species.

The Australian collection is kept separate for convenience of daily reference. The names of the contributors towards the Australian portion of the Herbarium can be gathered from the "*Flora Australiensis*," Mueller's "*Fragmenta Phytographiæ*," the *Victorian Naturalist*, &c. It is worthy of special remark that the Western Australian plants collected by J. Drummond and L. Preiss are largely represented in the Herbarium, while of New Zealand plants the Herbarium possesses collections from Sir Julius Haast, Dr. Sinclair, Professor Kirk, Mr. J. Buchanan, and others. The collections from Papua and Polynesia are especially rich, and are also kept separate for easy reference.

The Herbarium also contains large collections of European, Asiatic, African, and American plants, the intrinsic value of which may be recognized from the fact that they include large

numbers of plants named and issued by Agardh, Beccari, Cooke, De Candolle, Ecklon, Engler, Fenzl, Asa Gray, Hampe, Sir J. Hooker, Kotschy, Lehmann, Lindly, Moritzi, Philippe, Reichenbach, Schimper, Syme, Torrey, Wallich, Freyher, and many others.

A valuable collection of this kind is not an ephemeral or perishable treasure when properly handled and preserved, but is of permanent value. In some of the herbariums of Europe specimens are preserved quite uninjured, though collected fully 300 years ago, and the National Herbarium contains numerous specimens which were prepared by Thunberg, Ehrhart, and other disciples of Linnaeus, and indeed some by the pre-Linnean botanist Petiver, who died in 1718, besides a number collected by Robert Brown in Australia during years 1802 to 1805, when forming the first large collection of Australian plants. It may be mentioned that the oldest herbarium in the world is probably that of Rauwolf, in Leyden, 1576, which is still in good preservation.

The object of accumulating such large stores of dried plants is not to satisfy idle curiosity or personal gain. The aim is to trace the characteristics and range of any plant of either hemisphere, and to be able to verify plants from the original, or at least from authenticated specimens. It is hardly necessary to emphasize the necessity of being able to recognize and accurately determine plants having medicinal properties or technological value, although these form but a small fraction of all the plants with which science has to deal.

Nearly the whole of the systematic records of the world's vegetation rest on such material, for it is only by drying and preserving plants in herbaria that we can bring together the plants of the whole globe for comparison. Even then the task is a gigantic one, the number of species constituting the flora of the world, including the lower cryptograms, being about a quarter of a million. It is to such original material that we have through centuries to refer for all systematic work, and for the issue of every flora. In fact, all field work and field observation should be based upon herbarium work. Neither form of study can unaided meet with full success.

Finally, in addition to the dried specimens, the Herbarium possesses a very fine library of several thousand books, journals, &c., among them being some by pre-Linnean authors. The library is without doubt the best botanical one in the southern hemisphere, and, like the Herbarium, is accessible to all botanical workers for reference.

THE books and specimens of the late Mr. Chas. Walter have been purchased for the National Herbarium.

Lizards in Captivity.—A pair of common "bloodsucker" lizards, *Tympanocryptis lineata*, was captured at Fisherman's Bend on 12th October. Both have now been in captivity for two months. As a rule this species will not eat in captivity, but these specimens will feed freely, each devouring at a meal between 15 and 20 common house flies. They actively pursue the flies, which they catch on the end of the sticky tongue, and then proceed to chew leisurely. The larger lizard, while captive, shed its skin in small flakes, the largest patch of shed skin being about a quarter-inch square. The moulting process took about three weeks to complete. The ventral surface of this lizard is now yellow under the lower jaw, throat, and thorax, while it is pink under the hind legs and tail. The smaller lizard shows the normal greyish colouring.—R. W. Armitage.

The Flight of the Caper Butterfly.—During the progress of enormous numbers of this insect across my garden at Balwyn last Sunday week (1st Dec.), I noticed that they pursued one fairly definite course, and that in the face of a strong breeze; that is to say, they came from the east and passed over to the west. They showed no inclination to settle, but continued on until lost to view. This Sunday (8th Dec.) these butterflies were not nearly so numerous, but what there were came from south to north in the face of a moderate wind. This observation seems to be at variance with the usual view held, that flights of insects are often due to a steady prevailing wind; as, for example, the frequent and undoubted instances of Continental butterflies carried across the channel to the English shores. The question arises, what determines these flights, which I believe are better known in Queensland? Is it the desire to discover a suitable feeding ground for their progeny?—F. Chapman. Balwyn, 9th Dec., 1907.

Birds Near Melbourne.—"T. H. T." contributes to the weekly column of "Nature Notes," published in the *Argus* of 3rd January, some interesting notes on birds which are rarely seen near Melbourne, but which this season have come south, probably on account of the prevailing dry season. He mentions that the White-shouldered Caterpillar-eater has nested freely about Blackburn. At Wong Park, near Ringwood, he found the nest of the Black-capped Tree-runner, and not far away nests of the Rufous Song-Lark. Another observation was two clutches of the Leaden Fly-catcher being fed, but the nests could not be located. Cuckoos have, he says, been extremely numerous this season, and no less than six Red-browed Finches' nests were found about Olinda Creek, each containing a young dead cuckoo.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 13th January, 1908.

The president, Mr. G. A. Keartland, occupied the chair, and about 40 members and visitors were present.

CORRESPONDENCE.

From the Brisbane Field Naturalists' Club, offering full privileges of membership to members of the Field Naturalists' Club of Victoria when visiting Brisbane. It was decided to thank the Society for its action, and to cordially reciprocate.

REPORTS.

The excursion to Beaumaris on Saturday, 14th December, under the leadership of Mr. O. A. Sayce, was attended by about 20 members and visitors, the object being marine life. The tide was not so low as could have been desired for such work, but by wading sufficient material was soon obtained to occupy the party during the time at their disposal. Only the usual forms commonly found attached to or under rocks in shallow water were collected, and these formed the subject of some interesting remarks by the leader. A brief outline of the various forms of animal life found in the locality was given, the specimens obtained were then examined and their chief characters pointed out, and finally some useful hints on the collecting, preservation, and examining such forms concluded a very enjoyable outing.

The hon. librarian acknowledged the receipt of the following donations to the library:—*Journal of Agriculture of Victoria*, vol. v., parts 11 and 12, November and December, 1907, from the Department of Agriculture, Melbourne; "Report of Fisheries Board, New South Wales," 1906, and "Additions to the Fish-Fauna of New South Wales," No. 1, by D. G. Stead; "Forest Flora of New South Wales," vol. iii., part 7, by J. H. Maiden, F.L.S., Government Botanist, and "A Critical Revision of Genus Eucalyptus," part 9, by J. H. Maiden, F.L.S., from the author; *Agricultural Gazette of New South Wales*, vol. xviii, parts 11 and 12, November and December, 1907, from the Department of Mines and Agriculture, Sydney; "Proceedings of Linnean Society of New South Wales," vol. xxii., part 3, from the Society; "Proceedings Royal Society of Queensland," xx., 1907, from the Society; "Transactions and Proceedings of the New Zealand Institute for 1906," vol. xxxix., from the Institute; "Proceedings of Academy of Sciences, Philadelphia," vol. lix.,

part 1, from the Academy; "Annual Report of the American Museum of Natural History for 1906," from the Museum; "Revista do Museo Paulista," vols. ii.–v., 1897-1902, from the Museum; *Knowledge*, vol. iv., Nos. 10 and 11, October and November, 1907, from the proprietors; and *Nature Notes*, October and November, 1907, from the Selborne Society, London.

ELECTIONS.

On a ballot being taken, Mr. D. J. Mahony, M.Sc., Department of Mines, Melbourne, was elected an ordinary member, and Captain W. C. Thomson, Bank-street, Ascot, Brisbane, and Rev. Henry Wallace, Frankston, as country members of the Club.

GENERAL BUSINESS.

The president reported that a deputation, consisting of the representatives appointed by the various Victorian scientific societies and institutions, had interviewed the hon. the Minister of Lands, Mr. Mackey, on the 18th ult., regarding the permanent reservation of the National Park at Wilson's Promontory. The request of the deputation was explained by Professor Baldwin Spencer, who pointed out that it was desired that the whole of the Promontory be reserved permanently, that a ranger be appointed by the Government, and the park vested permanently in trustees.

Mr. Mackay, in reply, said he was thoroughly in sympathy with the wishes of the deputation. He was willing to vest the Promontory in trustees, but was sure the Cabinet would not at present agree to include the half-mile margin in the permanent reservation. He could, however, give the trustees control over it, and they need not permit any settlement unless the Cabinet decided otherwise for urgent public reasons. The revenue from the existing grazing leases amounted to £102 per annum, and this would be handed over to the trustees to be expended in the management of the park. He said he would also make the ranger an officer of the trustees. The Minister explained that, although reserved permanently, the land was still subject to the mining laws, and he could not give control over the timber, which was under the Forestry Department. He would, however, endeavour to make arrangements with that Department to limit any interference with the timber.

At the conclusion of the business a short conference was held in the Minister's room, kindly placed at the disposal of the delegates by Mr. Mackay, when it was decided to hold another meeting at a later date to consider the appointment of trustees and other matters.

Mr. Keartland said the matter ought to be pressed on as soon as possible, and a meeting held to appoint trustees.

Professor Ewart said that, while we owed a debt of gratitude to the Minister for his concession, the Club ought to regard it as an encouragement to seek for more. The present arrangement would be satisfactory so long as Mr. Mackay is in power, but with an unsympathetic Minister we might find matters very different. So long as timber-cutting rights are granted, there is considerable danger of damage being done to the park. The matter is rendered more difficult owing to the fact that more than one department is concerned.

Mr. A. D. Hardy, F.L.S., made some remarks on a trip by himself and some friends at Christmas, the object in view being to land on Wilson's Promontory at Sealers' Cove. Owing to unfavourable weather, however, a landing could not be effected. On the return journey from the Lakes the steamer took shelter at Sealers' Cove, and Mr. Bainbridge, one of the party, was able to spend part of a day on shore. He stated that he saw a wide valley well suited for kangaroos and wallabies, with the usual rich vegetation in the gullies, but most of the country was exceedingly rough. Wild dogs, and what was thought to be a Lyre-bird, were seen.

PAPERS.

By Mr. G. A. Keartland, entitled "Notes on the Plumage of Australian Parrots."

The author briefly referred to the many difficulties which beset the young collector when dealing with this group of birds, owing to the fact that some species maintain almost the same plumage throughout life, while in other species the young and the adult forms might be regarded by the novice as totally distinct birds.

An interesting discussion followed, in which Messrs. F. G. A. Barnard, A. D. Hardy, A. H. E. Mattingley, and Professor Ewart took part. Mr. Keartland replied fully to the various questions raised.

NATURAL HISTORY NOTES.

Mr. J. P. M'Lennan contributed a note on the question of whether both male and female flowers were borne on the same plant in the Casuarinas.

Professor A. J. Ewart referred at length to specimens and illustrations of the Onion Weed exhibited by him. Messrs. F. G. A. Barnard and A. D. Hardy also spoke on the subject, the former mentioning that some years ago he had seen an apparently much larger flowered form than that usually seen, at Wildwood, between Sunbury and Bulla.

EXHIBITS.

By Mr. F. G. A. Barnard.—Terrestrial Amphipods, Talitrus, sp., from Willsmere, Kew; flowers and fruit of Mountain Ash, *Panax sambucifolius*; and flowers of Kurrajong, *Brachychiton populneus*, grown at Kew.

By Mr. C. F. Cole.—Stuffed specimen of Grass-Warbler, *Cisticola exilis*, Vig. and Horsf. (male), from Auburn, 3/12/07.

By Miss C. Cowle.—Specimens of *Prostanthera lasiantha* from Narbethong, Vic.; also White and Pink Convolvulus and Mint from river bank at Yarra Glen.

By Mr. J. E. Dixon.—Ten species of Victorian longicorn beetles, with names of food plants.

By Professor A. J. Ewart, D.Sc., Ph.D.—Specimens and illustrations of each :—*Romulea cruciata*, Ker Gawl, Pink Star or Onion Grass, South Africa, type form; *R. cruciata*, Ker Gawl, introduced, Victoria; *R. rosea*, Eckl., South Africa, type form; *R. rosea*, Eckl., var. *speciosa*, South Africa; *R. bulbocodium*, Seb. et Maur.

By Mr. C. French, F.L.S.—Collection of exotic buprestid beetles.

By Mr. C. French, jun.—Living specimen of buprestid beetle, *Stigmodera fortunei*, found in mail room, G.P.O., Melbourne. Probably brought from Mallee district in mail bag.

By Mr. C. J. Gabriel.—Marine shells, *Voluta kreuslerœ*, Ang., and *Voluta verconis*, Tate, S. Australia; *Cypræa petitiana*, Crosse and Fischer, Senegal; *C. gaskeni*, Rve., Sandwich Is.; *C. cumingi*, Gray, Sandwich Is.; *C. clara*, Gask., W. Indies.

By Mr. A. H. E. Mattingley.—Eggs of Pelican, *Pelecanus conspicillatus*, from Lake Corrong.

By Mr. F. H. Schäfer.—Axe-head from New Caledonia; stone chisel from New Ireland.

By Messrs. W. and J. Stickland.—Specimens of *Lacinularia* (?) *elliptica* Shephard, obtained at Willsmere.

After the usual conversazione the meeting terminated.

It is with regret we record the death, on the 14th January, at the age of 80, of Major R. L. J. Ellery, F.R.S., F.R.A.S., formerly Government Astronomer of Victoria. Mr. Ellery was one of the few remaining "original" members of the Field Naturalists' Club of Victoria still on the roll. He was educated for the medical profession, but gave it up to enter the public service of Victoria, in which he served for about forty-two years. He was always a friend of science, and his willingness to help is evidenced by an active presidency of the Royal Society of Victoria extending over a period of more than twenty years.

"The Stone Age and the Aborigines of Lancefield District."—The editor of the *Lancefield Mercury* has reprinted in pamphlet form matter which has appeared in his paper from time to time respecting the aboriginal stone quarries on Mt. William, near that town. The notes make very interesting reading, and are the fullest record we possess of the life and habits of the aboriginals of that part of Victoria.

EXCURSION TO FRANKSTON.

Favoured by a fine day on Saturday, 23rd November, this excursion was well attended, and, in addition to the members of this Club, contingents from the Training College and Ramblers' Club were present, making a party of over forty. On leaving the station the Hastings road was followed for a short distance, when a turn was made southwards over the heath country. Special attention was directed to the search for as many specimens as possible of Cassytha growing on different hosts, at least twelve different hosts being found. The almost total absence of introduced plants in the ground selected for examination—many acres of native heath land—was remarked. The only naturalized alien found was *Hypochœris radicata*, L. It will be interesting to note in later excursions how long the native flora holds its own without change. The season was an early one, flowering being over in most cases, but over thirty-six plants were found in flower and identified, including *Boronia parviflora*, Sm. In spite of the presence of the Herbarium staff and of some of our better botanists from the Club, a few of the identifications proved on subsequent examination to be incorrect, the correct names being substituted in the following list of the more important plants noticed. Except in the case of the commonest and least variable plants field names must always be taken as provisional and open to correction.

Hibbertia densiflora, R. Br.
H. stricta, R. Br.
H. fasciculata, R. Br.
Cassytha glabella, R. Br.
Drosera spathulata, Lab.
Comesperma ericinum, D. C.
C. calymega, Lab.
Boronia parviflora, Sm.
Ricinocarpus pinifolius, Deof.
Casuarina quadrivalvis, Lab.
Stackhousia linarifolia, Cunn.
Viminaria denudata, Sm.
Dillwynia ericifolia, Sm.
Acacia suaveolens, Willd. (in fruit only)
Leptospermum scoparium, Forst.
Melaleuca squarrosa, Donn.
Isopogon ceratophyllus, R. Br. (in fruit only)
Hakea nodosa, R. Br. (in fruit only)
Hypochæris radicata, L. (only introduced plant found)
Lobelia anceps, Lf.
Utricularia dichotoma, Labill.
U. flexuosa, Vahl.
Leucopogon Richei, Lab.
Styphelia australis, F. v. M.
Brachyloma ciliatum, Benth.
Epacris obtusifolia, Sm.
Sprengelia incarnata, Sm.
Orthoceras strictum, R. Br.
Prasophyllum elatum, R. Br. (just past flowering)
Patersonia glauca, R. Br.
P. longiscapa, Sweet.
Dianella longifolia, R. Br.
Cæsia parviflora, R. Br.
Xyris gracilis, R. Br.
Hypolæna fastigiata, R. Br.
Lycopodium laterale, R. Br.
Lindsaya linearis, Swartz.

—Alfred J. Ewart.

The January *Emu* contains an excellent reproduction of a photograph by Mr. A. H. E. Mattingley of the nest, eggs, and young of the Night-Heron, *Nycticorax caledonicus*.

THE SPECIFIC NAME OF THE INTRODUCED PLANT KNOWN AS ONION WEED.

By D. M'Alpine.

(*Read before the Field Naturalists' Club of Victoria, 9th Dec.*, 1907.)

In excursions with my students to places of botanical interest in the neighbourhood of Melbourne, we often come across this weed, belonging to the Iridaceæ, which is generally known by the scientific name of *Romulea bulbocodium*, Sebast. and Mauri, as given by the late Baron von Mueller in his "Key to the System of Victorian Plants," and it has been regarded as a native of the Mediterranean region. But this specific name for the Australian importation has been called in question by various botanists in Australia, and at the present time there are at least three different names given to the same plant.

Mr. E. Betche, of the Sydney Botanic Gardens, examined this plant for Mr. Helms, of the Agricultural Department there, and wrote to him as follows, as recorded in the *Agricultural Gazette of New South Wales*, p. 232, 1901 :—"I examined the introduced *Romulea*, and find that it is, as you thought, *Romulea rosea*, Eckl., from the Cape Colony, and not *R. bulbocodium*, Seb. and Maur. The chief difference between the species is in the style-branches, which are described and figured as much overlapping the anthers in *R. bulbocodium*, and slightly overlapping them in *R. rosea*. In the Australian specimens I have seen the style-branches are shorter than the anthers, but I suppose that is variation."

Quite recently Prof. Ewart, Government Botanist of Victoria, has described it under the name of *R. cruciata*, Gawl., in the *Journal of Agriculture of Victoria* for September, 1907. It can readily be understood that it is very inconvenient, to say the least of it, when a student picks up a plant, for his teacher to give it three specific names, and to have to confess to such glorious uncertainty in systematic botany.

Accordingly I sent well-chosen specimens of the plant, both in flower and in fruit, to authorities who were in a position to settle, as far as present knowledge goes, the much vexed question of its specific identity. Among others, to the Director of the Royal Gardens, Kew, England, with a request for a thorough examination and the recognized scientific name. I have just received a reply from the Royal Gardens, Kew, dated 31st October, 1907, as follows :—

"The Director of the Royal Botanic Gardens, Kew, presents his compliments to D. M'Alpine, Esq., and begs to inform him that the plant received for identification is not *Romulea cruciata*, Gawl., but *R. rosea*, Eckl. It is probable, however, that *R. rosea* is conspecific with the Mediterranean *R. bulbocodium*, Seb. and

Maur., and has been introduced into and become naturalized in South Africa. The characters derived from the styles and stamens for separating these two species (as mentioned by Betche in *Agric. Gazette N.S.W.*, xii., pp. 232, 233), are not constant, as has been pointed out by Battandier in his paper—'Sur quelques cas d' Hétéromorphisme' (Bull. Soc. Bot., France, xxxiii., p. 238). The sections of the leaves and the seeds of both species are identical."

Dr. Ferdinand Pax, Professor of Botany at the University of Breslau, and author of the article on the Iridaceæ in Engler and Prantl's "Die natürlichen Pflanzenfamilien," has also named the specimens submitted to him *R. bulbocodium.*

This clearly settles the name as *Romulea bulbocodium*, and at the same time justifies the naming of the late Baron von Mueller, since, as the Director points out, the one name is conspecific with the other. It should induce members of the Field Naturalists' Club to study this imported weed more carefully, and to observe, particularly in the flower, the variations to which it is subject. In the specimens forwarded by me the anthers were a shade longer than the style-branches.

Food Plants of Victorian Longicorn Beetles.—The following list of localities and food plants for the longicorn beetles, exhibited by me at the January meeting, may be of interest to collectors :—

Uracanthus triangularis, Hope—Carrum. Food plants, Banksia integrifolia and Hakea nodosa.

U. triangularis (var.)—Frankston. F.p., Acacia mollissima.

U. simulans, Pasc.—You Yangs and Gippsland. F.p., Aster glandulosus.

U. simulans (var.)—Kororoit Creek. F.p., Correa speciosa (var.)

U. strigosus—Epping. F.p., Casuarina quadrivalvis.

U. bivitta, Newm. F.p., Furze, Ulex Europæus; Common Broom, Genista scoparia; Native Hop, Daviesia latifolia, and Viminaria denudata.

Distichocera par, Newm.—Greensborough. F.p., Leptospermum lanigerum.

Piesarthrius marginellus, Hope. F.p., Acacia longifolia and A. mollissima.

Hesthesis cingulata, Kirby—Ringwood. F.p., Eucalyptus amygdalina (saplings).

Symphyletes pulverulans, Bdv.—Frankston, &c. F.p., Acacia mollissima.

S. decipiens, Pasc.—Frankston, &c. F.p., Acacia longifolia, A. armata, and A. verticillata.

S. nigrovirens, Don.—Frankston, &c. F.p., Acacia mollissima.

—J. E. Dixon. Richmond, 13th January, 1908.

NOTES ON THE PLUMAGE OF AUSTRALIAN PARROTS.

By G. A. Keartland.

(*Read before the Field Naturalists' Club of Victoria, 13th Jan.*, 1908.)

It is accepted as a general rule that variation in plumage and markings are important factors in determining the species to which a bird belongs, just as structure and habits govern the genus. Yet to this rule there are exceptions. There are few groups of birds which furnish such an interesting study as the Psittacidæ. Some genera, such as Melopsittacus (Warbling Grass-Parrakeet), Polytelis (*P. barrabandi*, Green Leek, and *P. melanura*, Rock Pebble), and Spathopterus (Alexandra Parrakeet) having long, tapering tails. The King Lory, *Aprosmictus cyanopygius*, and Red-winged Lory, *Ptistes erythropterus*, possess broad tails, with the feathers of almost uniform length and rounded at the ends, whilst the Loriidæ have wedge-shaped tails ending in a narrow point. The Platycerci are furnished (as the name implies) with a broad, tapering tail, with the three centre feathers terminating in a blunt point.

But what I wish to direct your attention to is the fact that some species undergo little or no change in plumage during the whole course of their existence, whilst others vary so much between first feathering and maturity that young collectors may be readily pardoned for mistaking adults and young for separate species. If the sexes in some species can only be determined by dissection, there are others in which the difference is so great that the males and females can be separated at a glance. Then again, if some species are so uniform in colour and markings that birds require labelling to make sure of their identity, others vary so much that it is almost impossible to find two birds alike, and this variation often leads to mistakes.

To make my meaning clear we will now take the Loriidæ. In a number of instances I have taken nestlings of the Little Lorikeet, *Glossopsittacus pusillus*, Musk Lorikeet, *G. concinnus*, and Blue-bellied Lorikeet, *Trichoglossus novæ-hollandiæ*, and as soon as they were able to fly they were almost exactly like the parent birds in all but size. If a number of these birds are shot it will be found that age or sex makes very little difference.

In the genus Polytelis we have another genus in which uniformity prevails, but in a different manner. If fully matured the males are so much alike in colour and markings that without labels it is impossible to identify them. Although the females lack much of the brilliant colouring of those of the opposite sex they are equally regular in their plumage, while the same uniformity prevails in the young birds.

In marked contrast to the foregoing the genus Barnardius is

one in which surprises come thick and fast. Some years ago Mr. E. E. Johnson sent twenty-six Barnard's Parrakeets to me from Murtoa. I skinned and dissected them all. It was an easy matter to recognize each bird on account of the great variation in plumage. Whilst some were remarkably brilliant, others were equally dull, but, strange to say, the handsomest bird in the parcel was an old female, and the most sombre one an old male.

These remarks also apply to the Port Lincoln Parrakeet, *B. zonarius*. Whilst in the Northern Territory with the Horn Scientific Expedition, and in North-West Australia with the Calvert Exploring Expedition, I shot a great many of these birds, and the two most beautiful and brightly coloured specimens secured proved to be an old female and a nestling scarcely able to fly. Of all the rest there were no two birds exactly alike. Some males had beautiful black heads, sulphur-yellow breasts, and bright green backs. Occasionally a scarlet band adorned the forehead, but in others the scarlet was only partial or entirely absent. In several cases the heads of old birds looked as if they were fading to dark brown, and all the other colours were equally modified. I had two birds of this species in captivity for five years. They were both males, and neither of them underwent any change in brilliancy of plumage. That these variations are neither local nor indications of age I have fairly tested. These parrots have a very extensive range, and may be found from Port Lincoln in the south to Tennant's Creek on the Overland Telegraph line in the Northern Territory, and in the North-West I found them from within a short distance of Geraldton to about the centre of the desert, and, although many were shot, there were seldom two birds alike; in fact, one old female bird had the yellow breast so freely interspersed with green that at first glance I mistook it for *P. semitorquatus*.

The genus Platycercus embraces two distinct types of birds—*P. elegans*, Crimson Parrakeet, which changes from nearly all green in its early stages, to a beautiful crimson by the time it is four years old. These birds are all remarkably uniform. Then we have *P. eximius*, Rosella, and *P. flaveolus*, Yellow Parrakeet, two species which vary considerably in brilliancy of colours and markings. I have seen broods of six young ones of each species in which the difference between the birds was so great that each individual was easily identified. As time went on the same difference continued, the highly coloured specimens retaining their superiority over their fellows. I had some of the Yellow Parrakeets under observation for six years. With regard to the Rosella, many casual observers will declare them to be all alike, but a closer examination modifies or contradicts the statement. Whilst judging a class of twenty-seven entries of Rosellas at the North Suburban Bird Show I found such a difference in the

shades of colour and quantity and shape of the scarlet, especially on the breast, that I could recognise each bird without reference to its number in the catalogue.

Perhaps the best illustration of uniformity will be found in the Warbling Grass-Parrakeet, *Melopsittacus undulatus*. Some time ago I saw a large cage containing a number of these birds all of which were so exactly alike, except sexual difference, that it was impossible to distinguish one from another. Of course they were all over two years old; it takes a year for the young ones to attain maturity.

The Cockatoo-Parrakeet, *Calopsittacus novæ-hollandiæ*, and the Night-Parrakeet, *Geopsittacus occidentalis*, are also remarkable for uniformity when fully matured, although there is considerable difference between adult and young. In the case of the Cockatoo-Parrakeet the young males bear a close resemblance to the adult female, but in about six months they attain full plumage. When young the Night-Parrakeets are light brown on those parts of the feathers which are green in the adults, but after moulting they are all alike.

In conclusion, I may say that these notes are not by any means complete, and allusion might have been made to several other species, but my object has been to give some of our younger members a hint as to a field in which there is yet plenty of work to be done.

GEOLOGY IN RAILWAY CUTTINGS.

Many of the railway cuttings about Melbourne display geological sections of considerable interest, and the planting of the sides of embankments and cuttings with bright flowering plants, as lately initiated by the Railway Department, meant a considerable loss to geological students. The committee of the Field Naturalists' Club accordingly drew up a list of localities which it thought should be left in their natural state, and brought it under the notice of the Commissioners. We are glad to say that the Club's views were adopted, and a promise was given that the areas would be kept free from vegetation.

Following the name of the nearest station is the precise locality and its points of interest:—

North Melbourne ...	East side of approach from Spencer-street.—Older volcanic.
Footscray	Between Saltwater River and Hopkins-street bridge.—Bluestone.
Flemington Bridge ...	Cutting in Royal Park, both sides.—Tertiary.
Royal Park ...	Between station and Sydney-road and Park-street, both sides of each line.—Silurian.

Jolimont ...	...	West of station, and between station and tunnel.—Silurian.
West Richmond	...	Near tunnel.—Silurian.
Heidelberg	...	Melbourne side of station, south of bridge.—Silurian.
South Yarra	...	Between Brighton and Caulfield lines.—Tertiary.
Windsor ...	...	Between Chapel-street and Dandenong-road, north side.—Junction of Tertiary and Silurian.
Burnley ...	...	Between Swan-street bridge and Park footbridge, north side.—Bluestone.
Hawthorn...	...	Between Yarra and overhead bridge, south side.—Silurian.
Kew ...	...	Dead-end at station.—Junction of Tertiary and Silurian.
East Camberwell	...	Outer Circle loop-line, both sides.—Silurian and Tertiary.

The Casuarinas or She-oaks.—Acting on a hint given recently by Professor Ewart, the Government Botanist, I have examined the different species of Casuarina in the districts I have visited during the last two months, with the view of deciding whether they are monœcious or diœcious. I have been able to make observations at Nar-Nar-Goon, Moe, Glengarry, Sale, Bannockburn, Dunolly, Portland, Hamilton, and Casterton during that time, and in only one case did I notice a species monœcious. This was a form of *Casuarina distyla* growing at Heywood, near Portland. This species, however, is not monœcious in all cases; in fact, I am inclined to think that the diœcious form is the more common.—J. P. M'Lennan. Moonee Ponds, 13th Jan., 1908.

Plants of Sealers' Cove, Wilson's Promontory.—During a brief stay of a few hours at Sealers' Cove, while on a trip from Bairnsdale to Melbourne last month, I had the opportunity of collecting a few botanical specimens, which have been identified for me by Mr. A. D. Hardy, F.L.S. Though the list does not contain any great novelty, still it may be of use as an indication of the type of vegetation in the district:—Blackwood, *Acacia melanoxylon*; Native Ash, *Panax sambucifolius*; Hazel, *Pomaderris apetala*; Christmas Tree, *Prostanthera lasiantha*; Lilly-pilly, *Eugenia Smithii*; Swamp Tea-tree, *Melaleuca squarrosa*; Native Elder, *Sambucus Gaudichaudiana*; Kangaroo Apple, *Solanum vescum*; Native Mulberry, *Hedycarya Cunninghami*; Fire-weed, *Senecio velleyoides*, *Clematis aristata*, *Billardiera scandens*, and *Convolvulus*, sp. Ferns—*Dicksonia Billardieri*, *Alsophila australis*, *Osmunda barbara*, *Lomaria discolor*, *Gleichenia flabellata*, and from my description Mr. Hardy thinks one of the Cyatheas.—J. W. Bainbridge. 3rd February, 1908.

"Across the Baw Baw Mountains and Past the Yarra Falls."—Such is the title of the first tourist's handbook issued by the Lands Department of Victoria. It gives briefly, without much detail, a general idea of what is to be seen when following the newly opened up track between Warburton and Walhalla. It contains several interesting illustrations, notably one of the magnificent forest country between Mt. Erica and Walhalla, while of a totally different type is a glimpse of the beech forest at the heads of the Yarra and Thomson Rivers. Its chief value, however, consists in the map issued with it, which gives such full details that no tourist need be afraid to venture into that forty miles of uninhabited country, provided he has the map in his pocket. Besides a general map of the track, smaller inset maps on a larger scale are given of the vicinity of the Yarra Falls and about fifteen miles of the Baw Baw plateau. The guide is issued at the nominal price of sixpence.

"Handlist of the Birds of Australasia."—The Australasian Ornithologists' Union has just issued as a supplement to the *Emu* for January, 1908, a "Handlist of the Birds of Australasia" complied by Mr. Gregory M. Mathews, F.L.S., F.Z.S., M.B.O.U., &c., who, though an Australian by birth, is now a resident of the mother country, The list is based on the "Handlist of Birds," by Dr. Bowdler Sharpe, issued by the British Museum. The author states that it is his intention to publish a set of hand-coloured plates of the birds of Australasia, and he puts forward the list "to invoke the criticism and co-operation of ornithologists, in order to enhance the value of my larger undertaking." Full references are made to the writings of Gould, Ramsay, North, Campbell, and Hall, but, being based on the British Museum list, the sequence, and in fact names of the orders, vary very much from those to which we have been accustomed—for instance, the new list starts with the Emus, and concludes with the Crows, while the intermediate orders are grouped in quite new relationships. In view of the radical alterations introduced, it is to be regretted that the list is not indexed in any way. If an index of the genera was too large an undertaking, surely a systematic index of the orders and sub-orders might have been given, and so give at a glance a key to the arrangement, thus saving the reader wishing to consult it much needless search. Altogether 883 species are listed, a few of which are now extinct, and a broad definition of the locality where they occur is given. Seeing that the list extends to rather more than a hundred closely printed pages, the Union is to be congratulated on its enterprise, and we trust the sale of copies at two shillings and sixpence each will, to some extent, recoup the outlay.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 10th February, 1908.

The president, Mr. G. A. Keartland, occupied the chair, and about 63 members and visitors were present.

REPORTS.

A report of the excursion to Launching Place, extending from Saturday to Monday, 25th to 27th January, was read by the leader, Mr. F. G. A. Barnard, who referred to the many objects of interest met with during the outing, which was greatly enjoyed by the members taking part. The report excited some discussion, in which Messrs. A. H. E. Mattingley, G. Coghill, and F. Pitcher joined.

A report of the excursion to Black Rock on Saturday, 8th February, was read by the leader, Mr. F. H. Baker, F.L.S., who stated that eleven members and friends attended. The tide was, unfortunately, not low enough to allow of any collecting among the rocks, so that the attention of the party had to be devoted to such material as could be obtained along the beach. The following species were among those collected during the afternoon :—*Chamostræa albida, Tapes favagella, T. galactites, Cardita bimaculata, Mytilus planulatus, Barbalia fasciata, Hipponyx antiquatus, Turbo undulatus, Haliotis nævosa, Acmæa costata, Patella tramoserica.*

Mr. F. Pitcher reported on the junior excursion to the Botanical Gardens on Saturday, 1st February, the object being trees. He expressed his regret that so few juniors availed themselves of this excursion.

The hon. librarian reported the receipt of the following donations to the library :—"From Range to Sea," by C. L. Barrett, from the author ; *Journal of Agriculture of Victoria*, January, 1908, from the Secretary for Agriculture, Melbourne ; "Geology of the Hunter River Coal Measures, New South Wales" (with maps, plates, and sections), being "Memoirs of the Geological Survey of New South Wales—Geology, No. 6," by Prof. F. W. Edgeworth David, B.A., F.R.S., from the Department of Mines and Agriculture, Sydney ; "Forest Flora of New South Wales," parts 27–29, by J. H. Maiden, F.L.S., from the author ; "Report for 1906 of the Director Botanic Gardens and Govern-

ment Domains, New South Wales," from the Director, Mr. J. H. Maiden, F.L.S.; *Knowledge*, December, 1907, from the proprietors.

GENERAL BUSINESS.

The president drew the attention of the members to the proposal of the Premier to grant 15 acres of the Domain grounds as a site for the proposed new hospital. He said it was greatly to be regretted that any such proposal should be brought forward which would interfere with our public parks and reserves. Most of the parks around Melbourne had been encroached upon from time to time for various purposes, and it was time that a strong protest was made against any further alienation. He moved—"That this meeting is strongly opposed to any further encroachment on our public parks such as is involved in the proposed grant of a portion of the Domain grounds for the rebuilding of the Melbourne Hospital, while disclaiming any opinion as to the suitability or otherwise of any of the proposed sites."

Mr. F. G. A. Barnard, in seconding the motion, which was carried, said that there could be no doubt as to the importance of the question involved, and trusted the sale of the Kew Asylum lands would not be allowed without a strong protest.

Mr. G. A. Keartland read a communication from the hon. secretary of the committee recently formed to report on questions relating to the *Game Act*, &c., submitting for the consideration of the Club a request from Mr. H. Thatcher, president of the Vermont Progress Association, to the Chief Inspector of Fisheries, that Wood-Swallows should be protected during the whole year, on the grounds that these birds are most useful to farmers and fruit-growers. He moved—"That in the opinion of this Club the request should be complied with, and the Government be asked to protect these birds during the whole year." The motion was carried unanimously.

PAPERS.

1. By Messrs. G. A. Waterhouse, B.Sc., F.E.S., and G. Lyell, F.E.S., entitled "Some Dimboola Butterflies."

The authors gave some interesting notes of a trip to Dimboola in November last, the principal object in view being to obtain specimens of the rare "blue" butterfly, *Ogyris waterhouseri*, Baker, long known to Victorian collectors under the name of *O. idmo*, Hew., a Western Australian species. Though unsuccessful in capturing any specimens, two were seen on the wing, and a single egg, presumably of this species, was found on the mistletoe, *Loranthus pendulus*. The conclusion arrived at was that a visit a little earlier in the season would prove more

successful. A list of the butterflies seen during the trip was also given.

Mr. J. A. Kershaw, F.E.S., made some explanatory remarks regarding *Ogyris waterhouseri*, and showed examples taken at the Grampians in November, 1887. He stated that one of the earliest captures of this species was a specimen in the National Museum collection, which was taken in 1872. Specimens had also been taken at Inglewood.

2. By Mr. C. French, F.L.S., F.E.S., entitled "A Naturalist's Health Trip to Northern Queensland."

The author gave an interesting account of the various plants, &c., which came under his notice during a recent visit to North Queensland, and regretted that ill health allowed him to see so little of that naturalist's paradise.

The president and Messrs. H. J. Coles and F. G. A. Barnard spoke to the paper.

3. By Professor A. J. Ewart, D.Sc., Ph.D., entitled "Contributions to the Flora of Australia," No. 8.

The author recorded a number of naturalized alien plants, and corrected several errors in previous records.

The paper, which was of a technical nature, was taken as read.

NATURAL HISTORY NOTES.

Mr. A. D. Hardy, F.L.S., stated that a large number of Musk Lorikeets, *Glossopsittacus concinnus*, Shaw, had appeared recently in the orchards of Upper Macedon, where they had not been seen for years. This visitation was said to be due to a scarcity of eucalyptus blossoms, particularly that of *E. melliodora*.

Mr. F. Pitcher drew attention to his exhibit of larvæ, probably a species of Caddis fly, which was very destructive to the *Nymphæas* growing in the new lily lake in the Melbourne Botanic Gardens.

Mr. G. A. Keartland remarked on the great variation in colour of skins which he exhibited of Jardine's Campephaga, *Edoliisoma tenuirostre*, from New South Wales and Victoria, the latter being much lighter than those from New South Wales.

EXHIBITS.

By Mr. F. G. A. Barnard.—Growing specimen of fern, *Asplenium umbrosum*.

By Mr. G. Anderson.—Indian moccasins and bag, from North America.

By Mr. C. F. Cole.—Stuffed specimens of young male and female of Gould's Harrier or Swamp-Hawk, *Circus gouldi*, Bonap., taken at Mud Island, Port Phillip Bay, 10/12/07.

By Mr. H. J. Coles.—Lime sticks, dagger of Cassowary bone, and ear-rings, from New Guinea; shield from Trobian Island; Black-shouldered Kite, *Elanus axillaris* (female), from Kew.

By Mr. E. J. Dixon.—Specimens of the longicorn beetle *Uracanthus bivitta*, Newm., found breeding in Tree Lucerne, *Cytisus proliferus*, used for hedges, in Oakleigh and Brighton districts—a new food plant for this species; also 11 species of Victorian longicorn beetles, with names of their food plants.

By Professor A. J. Ewart, D.Sc., Ph.D.—*Gastrolobium grandiflorum*, F. v. M., loc., 160 miles from Cairns, Queensland, in illustration of Mr. French's paper. With one exception this is the only Gastrolobium found out of W. Australia, and the only Queensland species.

By Mr. C. French, F.L.S., F.E.S.—Photographs of N. Queensland scenery in illustration of his paper.

By Mr. C. French, jun.—New longicorn beetle, *Macrones bestii*, male and female, collected by Messrs. D. Best and C. French, jun., at the Alps and Buffalo Ranges, Victoria.

By Mr. C. J. Gabriel.—Rare marine shells of genus Cypræa :—*Cypræa similis*, Gray, S. Africa; *C. algoensis*, Gray, S. Africa; *C. pyriformis*, Gray, Ceylon; *C. walkeri*, Gray, N. Australia; *C. walkeri*, var. *rossiteri*, Dant., N. Caledonia; *C. coffea*, Sow., Lifu; *C. goodalli*, Gray, Panmotos Is.; *C. sulcidentata*, Gray, Sandwich Is.; *C. tessellata*, Swain, Sandwich Is.; *C. physis*, Brocch., Algeria; *C. becki*, Gask.; *C. oweni*, Sow., Mauritius.

By Mr. G. A. Keartland.—Skins of Jardine's Campephaga, *Edoliisoma tenuirostre*, from New South Wales and Victoria, showing considerable variation in plumage.

By Mr. J. A. Kershaw, F.E.S.—Specimens, male and female, of butterfly *Ogyris waterhouseri*, Baker, taken at the Grampians, November, 1887.

By Mr. J. S. Kitson.—Young mantids, reared from cocoon taken at Williamstown.

By Mr. A. Mattingley.—White-headed Stilt, *Himantopus leucocephalus*, Gould, from Mathoura, New South Wales.

By Mr. F. Pitcher.—Blooms of two late-flowering acacias, from Melbourne Botanic Gardens; *Acacia elata*, A. Cunningham, Pepper-tree Wattle, New South Wales; *A. implexa*, Bentham, Whitewood Acacia, Victoria, New South Wales, and Queensland; also larvæ of insect destroying Nymphæas in the new lily lake at Melbourne Botanic Gardens.

After the usual conversazione the meeting terminated.

SOME DIMBOOLA BUTTERFLIES.

By G. A. Waterhouse, B.Sc., F.E.S., and G. Lyell, F.E.S.

(*Read before the Field Naturalists' Club of Victoria*, 10*th Feb.*, 1908.)

Some twenty-two years ago, on a collecting excursion to the Grampians, the late Mr. W. Kershaw, in company with Mr. Joseph A. Hill, of Kewell, captured a number of specimens of a butterfly which he identified as *Ogyris idmo*, Hew. The species has been figured by Anderson and Spry in "Victorian Butterflies," p. 104. Mr. Hill has since seen the same butterfly at the Grampians (Rose's Gap, November, 1901), and at Mt. Arapiles (November, 1903), but in neither instance was he able to capture a specimen. Those collectors who have tried to net an Ogyris butterfly can sympathize with him in his failure; few butterflies are so difficult to capture, and had we not learned something of the life-history of the members of the genus few collections would boast of more than an odd specimen or so.

In November, 1903, we had sent us by Mr. Frichot, of Dimboola, a freshly caught male and female of this butterfly, and a little later, on comparing them with typical *Ogyris idmo* from Western Australia, we found points upon which they did not agree. We therefore submitted both species, together with others of the genus, to the well-known authority on the *Lycænidæ*, Mr. Bethune Baker, of Birmingham, England. He agreed that the Victorian species was distinct, and without referring again to us published the description under the name of *Ogyris waterhouseri*.

Mr. Frichot having left Dimboola, there seemed little chance of further specimens, so this year we determined upon a personal search for the species. Mr. Hill gave us what help he could, but his localities were far from the railway, and he himself was too busy to be able to promise to go with us. However, at the last moment, we were fortunate enough to induce Mr. Frichot to go with us as guide.

We left Melbourne by the Adelaide express on Monday, 18th November, and reached Dimboola shortly after midnight. Morning found us early astir, and with the bright, hot sunshine our hopes of success ran high. For three days we searched the bush, paying very special attention to those eucalypts upon which the mistletoe, *Loranthus pendulus*, was growing. Though we did not capture *Ogyris waterhouseri* we saw one specimen flying around and settling upon the mistletoe, and another flying in a "bee-line" across the sandy heath country, where clumps of dwarf Banskia are interspersed with various flowering shrubs, then past their best, including occasional specimens of the showy scarlet "bottle-brush," Callistemon.

Upon eucalypts supporting bunches of the Loranthus we found a good number of empty Ogyris pupal skins, many of which undoubtedly belonged to the present season's brood. Upon one

branch of the mistletoe itself we found a single light green hemispherical Ogyris egg with a regular pattern on apex. This egg was not that of *O. genoveva*, *hewitsoni*, *olane*, or *abrota*, all of which are well known to us, and we are fairly safe in concluding that it was *O. waterhouseri*.

We have come to the conclusion that our visit was a few weeks too late to secure the larvæ or pupæ of this species, and almost too late for the imagines. The latter half of October would, we consider (in a normal season), give better chances of success. Though we found many empty pupal skins, we failed to find a single pupa or larva, and in three days of keen search, in highly favourable weather, we saw but two of the butterflies on the wing. The finding of a single egg may point to a second brood, but of this we have no other evidence.

In the cavity of the trunk of a eucalypt bearing a bunch of *Loranthus pendulus* we found one full-grown larva and one pupa of *Ogyris genoveva*, already recorded from Dimboola in the *Victorian Naturalist*, vol. xxiii., p. 115. The pupa emerged before we left Dimboola, and produced a female *O. genoveva* of the blue form. Both pupa and larva were attended by large tan-coloured ants with black heads (*Campanotus*, sp.), and though we disturbed these ants at the base of some six or eight eucalypts, it was only upon the one tree that we found the *O. genoveva*.

Upon the sheoak trees (Casuarinas) the reed-like mistletoe, *Loranthus linophyllus*, was fairly plentiful, and a good number of the empty egg-shells of *Ogyris hewitsoni* were noticed, while a few of the butterflies were hovering round the trees.

While our efforts were mainly directed to the species we had specially made the journey for, we did not neglect other butterflies, and secured specimens of the following:—*Pyrameis itea*, *P. kershawi*, *Junonia vellida*, *Heteronympha merope*, *Xenica kluggi*, *Miletus ignita*, *Candalides cyanites*, *Zizera labradus*, *Nacaduba biocellata*, *Neolucia agricola*, *Neolucia serpentata*, *Paralucia pyrodiscus*, *Ogyris genoveva*, *Belenois java* (very plentiful), *Hesperilla dirphia*. In two small local show-cases we identified the additional species *Danais petilia*, *Delias aganippe*, *Elodina quadrata*, *Terias smilax*, *Polyommatus boeticus*, *Ogyris hewitsoni*, *Ogyris waterhouseri*, *Lucia lucanus*, and *Ialmenus evagoras*; also a melanic variety of *Pyrameis kershawi*, in which the apices of fore-wing were very dark; all white spots in the apical area were wanting. We have thus twenty-four species of butterflies to record from Dimboola, and a visit at another season of the year would doubtless add several to that number.

A very pleasant, if not altogether successful, trip was brought to a close by our reaching Melbourne again on Friday, 22nd November. These dates we hope will be of use to any other entomologist who is sufficiently interested to travel so far after this rare species.

A NATURALIST'S HEALTH TRIP TO NORTHERN QUEENSLAND.

By C. French, F.L.S., F.E.S., Government Entomologist, Victoria.

(*Read before the Field Naturalists' Club of Victoria, 10th Feb.*, 1908.)

Acting upon the advice of Drs. Player and Maudsley, I left Melbourne in September last for a trip to Queensland in the good steamer *Wyandra*, and proceeded to Cooktown, as the furthest point of my destination, a distance of some 2,000 miles. I must here thank the A.U.S.N. Company for the very liberal travelling concessions made to myself and my wife, who was with me, as in many ways I was unable to help myself, owing to rheumatic troubles; and also the Agricultural Department, for having kindly granted me the necessary leave of absence.

On the way up to Sydney thousands of Short-tailed Petrels, "Mutton-birds," were to be seen wending their way towards Victoria, but after leaving Sydney we saw nothing more of them. Upon arrival in Sydney I called to see my old friend, Mr. J. H. Maiden, F.L.S., Government Botanist and Director of the Botanic Gardens. It would be needless for me to speak of the magnificent palms, Ficus, and other tropical plants for which these gardens are famous. In Sydney they were having a terribly dry and hot spell of weather, still the bedding out and other floral displays were looking well, the gardens, as usual, being well patronized.

Our next port of call was Brisbane, at which place I was sorry to find the gardens dried up and the famous water-lily lake a mud-hole, with the glorious Bamboos, Strelitzias, Ravenalias, &c., still on its banks defying the drought. The Brisbane gardens are most unfortunate in being either dried up or else flooded to a depth of several feet, so that as a consequence the reputation of the place suffers. It is somewhat astonishing that in and around Brisbane there is hardly a decent specimen of Bunya Bunya Pine to be found, the fine trees of the Melbourne district putting the Brisbane specimens altogether in the shade.

Some forty miles on the Northern line is a delightful place, Wombye, where occurs a tropical belt, with its Kentia palms, giant nettles, tree-ferns, and orchids in profusion, and in getting there the singular Glass-house Mountain is passed. This spot would appear to be the natural home of the scrub-leech, which is strongly in evidence everywhere, and specimens of which furnished the principal material for the excellent monograph written by our Miss Lambert (Mrs. A'Beckett), and published by our Royal Society. Pineapples are grown to perfection in the district.

At Brisbane several well-known entomologists came to see me,

among them being Mr. H. Tryon, the Government Entomologist of Queensland, who was anxious to know something more of the Fruit-fly restrictions in Victoria; the Brisbane Field Naturalists' Club also sent me an address of welcome.

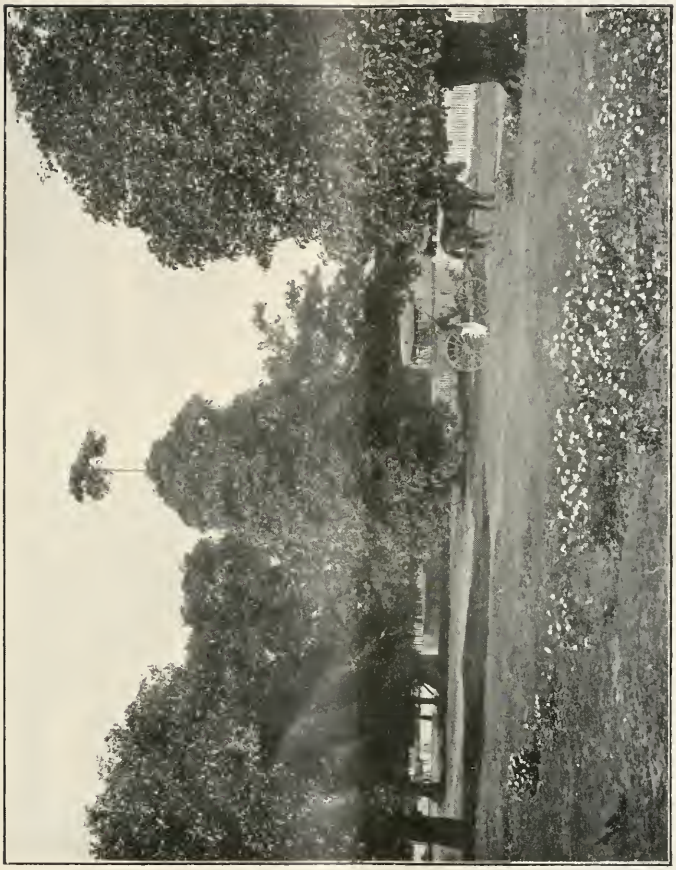
After leaving Brisbane, Bowen was the next port at which our vessel—a large one for shallow water—was able to call, Rockhampton and Mackay having to be communicated with by tender. Here we saw for the first time Cocoanut Palms lining the streets, close to and facing the sea, and then in fruit. A short stay was made here, and then a call was made at Townsville. Some few miles out of the town are some fine specimens of the Mango and other tropical trees, the whole place, however, having a dried and parched appearance. Some very fine specimens of the gorgeous *Poinciana regia*, one of the most strikingly beautiful of all flowering trees, were to be seen in full bloom; the magnificent orange-scarlet blossoms may be seen for miles away. I was very pleased to welcome some old Victorian friends (naturalists)—the Gullivers—at this place. Townsville has quite a reputation for heat and discomfort, so I was not sorry when we left it behind us. (13 inches of rain, however, has fallen here since our visit.)

Proceeding on our journey, the scenery of this part of the coast proved very interesting, especially so the numerous islands, studded here and there with Hoop-Pines, *Araucaria Cunninghami*, growing in profusion, and crowning many of the hills to the summits. The steamship at times passed quite close to several of these pine-capped islands.

Cairns was our next port, but before reaching it we passed on the way the fine lofty peak of Mount Bellenden-Ker, 5,100 feet, on the summit of which my cousin, Mr. W. Sayer, as will be recollected, discovered the first Rhododendron, *R. Lochæ*, F. von M., recorded for Australia, and also the splendid *Dracophyllum Sayeri*, F. v. M., with *Agapetes Meiniana*, F. v. M., and many other plants then new to Australia. Mount Bartle-Frere, 5,400 feet, also formed a splendid object as we saw it from the vessel.

Cairns is built on a very flat piece of country, being not more than a few feet above sea level, while the bay is fringed with mangroves. The main street of Cairns is celebrated for its umbrageous trees, while all waste lands are covered with *Vinca rosea* and the white variety of it. These, being in full bloom, formed a most attractive picture, especially to one who had been accustomed to see the same plants grown only under glass. Here it is a noxious weed and a scourge, just as are some of our weeds in Victoria. In the streets of Cairns are some magnificent specimens of Ficus, Bauhinias, Mangoes, and other fine tropical trees, some of the former being over 30 feet across, and furnishing the densest of shade, as will be seen by the plate. I have since

PLATE 4.



A PORTION OF MAIN STREET, CAIRNS.
With Mango trees, Ficus, and *Vinca rosea* in foreground.

PLATE 5.

STONY CREEK FALLS, NEAR CAIRNS.

heard that some vandals had taken it into their heads to have these fine trees chopped out, but I am pleased to say that, public opinion being fortunately too strong against them, they failed in the attempt.

The train journey from Cairns to Kuranda on the Cairns-Herberton line is something to be remembered, as after travelling a few miles the slow ascent of the mountains is commenced, and the vegetation begins to improve both in beauty and density. As we climb up these formidable steeps the forests on either side are clothed with plants of many descriptions—orchids, Monstrea, Pothos, and other epiphytal plants, too numerous to note in a hurried railway journey such as this was; tall Kentia palms adding greatly to the beauty of the scene. A few miles on the Cairns side of Kuranda we pass by the splendid Stony Creek Falls, of which I present a plate. The face of these falls is some 300 feet in height, and covered with ferns, amongst which I noticed our old favourite *Gleichenia flabellata*, and other fine ferns, including what I took at a glance to be the so-called Ribbon-Fern, *Ophioglossum pendulum*, and the Bird's-nest Fern, *Asplenium nidus*. I was informed that when at their best these falls throw their spray over the train in passing. Proceeding on we pass the marvellous valley of the Barron River, its stupendous falls not being nearly at their best at the time of my visit. (The photograph here given shows the falls at about three-quarter flood time.)

Kuranda having been reached, a glorious sight presented itself; here is a forest of eucalypts, acacias, cedars, &c., with palms and tree-ferns in profusion. Kuranda is undoubtedly a veritable paradise for the naturalist. Street's coffee plantation, with its pretty garden, is just across the Barron River, the Jacarandas there being particularly fine. At Kuranda is the home of Mr. F. P. Dodd, an insect collector, who has a magnificent collection of Lepidoptera. Most of the specimens, having been reared, are consequently in the best possible condition. Amongst them he has grand specimens of the rare Queensland Atlas Moth, Charagias, and several other fine species, besides many rare beetles. Some of the latter I secured for my collection, and amongst the gems which I obtained here may be mentioned a splendid new buprestid beetle of the genus Cyria, some fine lucanids, longicorns, Callirhipis, Lymexylonidæ, &c.

After leaving Kuranda, with its lovely Jacarandas, Poincianas, &c., the country becomes poor and miserably uninteresting, reminding one of some of the driest and poorest-timbered country of our own State. A large portion of the country, however, besides being auriferous, contains tin, copper, wolfram, and other valuable minerals. In these dry parts the Pandanus or Screw-Pine, together with Cycads and Macrozamias, appear to take the

place of fern trees, while two species of grass-trees, together with the hillocks made by the White Ants—the latter one of the scourges of the country—form quite a feature in the general landscape, many of the habitations of these termites being up to 10 feet in height. We saw these parts of North Queensland at their worst, for when the tropical deluges arrive in January and February the face of the whole country is at once changed into a vast greenery. (Over 60 inches of rain has since fallen.) At Mareeba we left the Government line and continued on the Chillagoe company's line for some distance, then at a place called Lappa Junction changed trains for Mount Garnet, about 170 miles inland from Cairns, and situated in the watershed of the Herbert River. A ten-mile buggy drive from there brought us to the famed Inot Springs, at which place there is excellent accommodation for persons who, like myself, suffer from rheumatic troubles.

The country traversed between Mount Garnet and the Springs was, at the time of my visit, dry and most uninteresting. At the former place I found a naturalist schoolmaster, who has a very interesting collection of minerals, &c.

Mention must be made of a poisonous weed which grows plentifully between Mount Garnet and the Springs, and is very fatal to cattle and horses, but goats, I am informed, are little affected by it. In consequence of the prevalence of this weed, together with the cattle tick, large flocks of goats are kept by the residents. As the plant was not in flower at the time of my visit, I arranged with a friend to send suitable specimens both in flower and fruit later on. These I have submitted to the Government Botanist of Victoria, Professor Ewart, who has identified the plant as *Gastrolobium grandiflorum*.

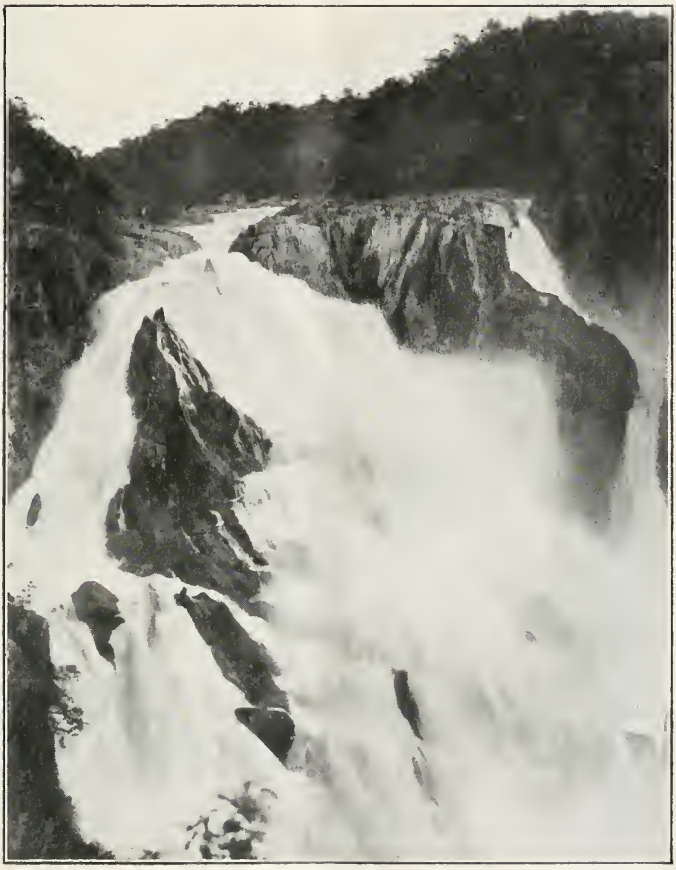
The Angora breed of goats thrives splendidly here, as do crosses between the Angora and commoner breeds.

The mail coaches to and from Herberton (30 miles) and Mt. Garnet call at the Springs to take up and deliver mails, always an important event in these quiet parts.

Dingoes and ticks are very numerous in these parts, and are a great source of trouble to the people of the district, which latter is largely peopled by "tin scratchers"—*i.e.*, persons who mostly fossick in the creeks, and many of whom earn a good living, the tin being sent to Irvinebank on pack-horses.

Having tried the baths, I left again for Cairns, where the best part of two days was spent among the banana and pineapple plantations, some 10 miles distant from the town. These, being situated in flat country skirting the mountains, are fairly well sheltered, and extend over some hundreds of acres. The land is good, having been formerly occupied by tropical scrub. The banana cultivation is solely in the hands of the Chinese, who

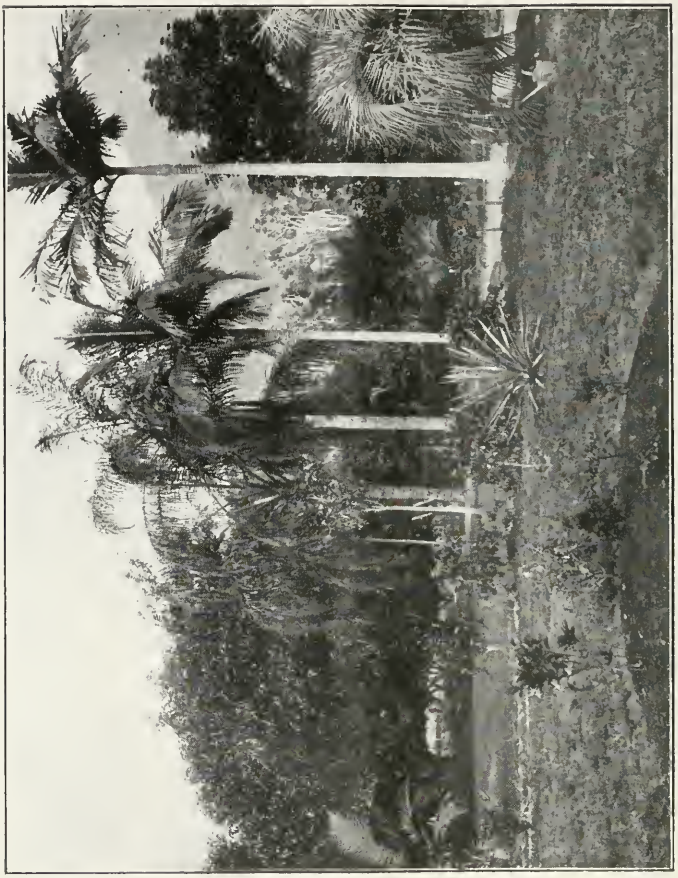
PLATE 6.



BARRON FALLS (IN THREE-QUARTER FLOOD), CAIRNS DISTRICT.

Fall of 700 feet.

PLATE 7.



VIEW IN THE GOVERNMENT EXPERIMENTAL GARDENS, KAMERUNGA,
Near Cairns.

often grow pineapples, mangoes, paw-paws, as well as other tropical fruits, in their holdings. The banana plants which we saw were rather dwarf and of sturdy growth, and it appeared to me that but little systematic cultivation was practised ; the pine-apples also were inferior in size, and grown in the most primitive manner possible. I could not help drawing a comparison between these plants and the splendidly-grown pineapples which I once saw at Redland Bay, some 30 miles down the river from Brisbane, where good cultivation was the order of the day, and the profits very substantial.

I noticed that the Chinese are planting Citrus trees on a fairly large scale in the banana plantations around Cairns, and from what I could gather they intend giving up growing bananas alto-gether. The Fruit-fly is in very strong evidence, most of the bunches which we saw being covered with net bags, this being supposed to lessen the chance of egg-laying by the flies. The Chinese, and, indeed, all the growers whom I met, appeared to be anxious to do their utmost to keep down the fly, and also to comply with the regulations bearing upon the same. Many of the Chinese appeared to be very business-like in their habits, and some fine teams of horses, well fed and groomed, bear testimony to their care of domestic animals. The produce grown on the plantations is carted to the Redlynch station on the Cairns-Herberton railway, and sent to Cairns for shipment.

The mangoes, seen everywhere, are very prolific, and in my opinion a fortune is in store for some enterprising firm who would enter upon the paying industry of chutney-making, hundreds of tons of these fine fruits being annually sacrificed for the want of a market for them. I obtained some authentic figures regarding this matter, which show that the waste is appalling, and at the same time the supply of mangoes in North Queensland is practically unlimited.

I greatly regretted being unable to visit Geraldton, a port lower down the coast, as from there the large bulk of the bananas which come to our State are grown. Here again the whole business may be regarded as being in the hands of the Chinese.

The tropical vegetation is very rank about Cairns, hundreds of acres being taken up by plants of guavas, lantanas, and other plants which had escaped from gardens in the vicinity. The Government Gardens at Kamerunga are not far away. In these we spent some hours, admiring the fine collections of tropical plants of value and introduced from many parts of the world. Several varieties of coffee, cotton, sugar-cane, some vanilla, &c., were noticed, and these, grouped together with other useful and ornamental plants, made quite a feature in this interesting and useful establishment.

We were now in the home of the Crocodile, the Cassowary, the

Queen Victoria Rifle-bird, and other tropical forms. We were fortunate in seeing one male and two female Rifle-birds, but saw no traces of the first-named creatures. Birds are extremely plentiful here, and I was indeed sorry that my condition prevented me from doing any walking, as the botanical treasures alone are well worth the journey, while the scrubs must be teeming with the lower forms of animal and plant life.

I had almost omitted to mention Cardwell, situated between Townsville and Geraldton, and formerly known as Rockingham Bay. It was at this place, which is probably richer in splendid tropical plants than any other part of Queensland, that the late Mr. John Dallachy spent many years in collecting for the late Baron von Mueller; and collecting was at that time no mere child's play, the blacks being then very hostile and treacherous, so that a man, as the saying goes, carried his life in his hands. At that time, thirty years ago, there was no settlement at Rockingham Bay, a few solitary cattle stations being the only signs of civilization for hundreds of miles around, and amid such surroundings the pioneers of this part of Australia settled, and our old botanical collector worked and died. I had heard a great deal about this place, but getting from a large steamer on to a small tender was not conducive to the comfort of a rheumatic patient, so I had to try and content myself with what I had heard and seen of the Indo-Malayan plants of this district.

We left Cairns with some reluctance, and proceeded to our destination, Cooktown. I had a very kind invitation from Mr. F. W. Barnard, of the Mosman River, near Port Douglas, to visit his place, but, although he took the trouble to board the vessel in the middle of the night, I was unable to face the trip; and for a description of the beautiful country around the Mosman I must refer our members to the very excellent account given in the Club's journal for January, 1899 (vol. xv., p. 104), by his cousin, our Mr. F. G. A. Barnard, when describing his visit to Northern Queensland. At the Mosman and about Geraldton, on the Johnstone River, is to be seen some of the finest jungle country in tropical Australia, the rainfall at Geraldton being recorded in feet instead of inches. The Mosman is now one of the principal sugar-growing districts in Queensland. The Daintree River, which is a little further north, is classic ground to our Club, as it was from here that I first obtained from a naturalist friend fruits of the fine palm, *Nipa fruticans*, then new for Australia, a record of this exhibit being in our Club's journal. This plant was afterwards found by the late Mr. Pentzke, who was then collecting for Baron von Mueller.

Cooktown, as we all know, is an historical spot, the fine monument reminding one of the illustrious navigator who first cast his anchor in the Endeavour River. At Cooktown were seen

PLATE 8.

CAPTAIN COOK'S MONUMENT, COOKTOWN.

large numbers of aboriginals, nearly every home of any pretensions having one of them at least as help ; some residents, as, for example, the Olives, Gibsons, and others, having had blacks of both sexes from childhood, some of whom have married and had families, all appearing to be well fed and kindly treated. The "casual" hands live together on an island close to Cooktown, and, as the eight hours question is unknown to these children of the forest, they may be seen about 3 p.m. wending their way towards their canoes, which are fastened during the day to the mangrove bushes which fringe the harbour, 10 till 3 being their usual hours of work. The little nude children are carried on the shoulders of their mothers, the usual troop of mangy-looking dogs completing the picture. My wife, who had not before been accustomed to such scenes, was greatly disgusted to see the ladies (gins), both young and old, smoking dirty black pipes. We saw one lady, the daughter of a squatter, accompanied on horseback by a young gin who was puffing away for all she was worth. In the early days of Cooktown the blacks were both numerous and hostile, many an unfortunate teamster having been speared and robbed by them. A few miles from here, across the water, at Cape Bedford, is a large mission station for the blacks, where all seem to be well cared for.

Through the kindness of Mr. Olive we procured excellent accommodation at a place, Mrs. Allen's, where we were told friend Gabriel, of our Club, and other naturalists, including Mr. Saville Kent and Dr. Roth, had stayed during their visits to these parts. I was very pleased with Cooktown, its main streets being lined with superb specimens of Mangoes, Barringtonias, Leichhardt trees, and a splendid umbrageous tree with flowers not unlike an enlarged flower of *Hakea eucalyptoides*, but which I could not recognize. Although the town is not the busy place it was of old when the Palmer diggings were at their zenith, it is very pretty, and much more Australian in character than are either Cairns or Townsville. Mount Cook forms a splendid background and shelter for a portion of the settlement.

We saw a good deal of Cooktown, and its cool climate seemed quite a pleasant change after the hot and vitiated air of both Cairns and Townsville. In the public gardens there are magnificent specimens of Crotons, splendidly grown and coloured to perfection, whilst our choicest Caladiums, Ixoras, Combretums, Allamandas, Acalyphas, and other plants of our hot-houses thrive like weeds in the open air. The beautiful Frangipani was everywhere to be seen in full flower, and the further north one goes the more deciduous does this plant become, as in Cooktown the flowering plants had hardly a leaf upon them, while in Brisbane and Sydney the foliage was present.

About a mile from the township resides the Olive family,

naturalists and enthusiasts every one of them. The garden attached to the house is worth going a long way to see; here were to be seen some magnificent specimens of highly coloured Coleus, with leaves as big as those of cabbages, *Clerodendron Balfouri*, *Allamanda Wardleyana*, with paw-paws, grenadillas, mangoes, and other tropical fruits in abundance. In and around this little tropical Eden may be seen the splendid butterflies, *Ornithoptera cassandra* (green and black), *Papilio ulysses* (blue), and hosts of others of more or less showy colours. Mount Olive, so named by its genial owner, is noted for its natural beauty, its enormous Pythons, and Deaf Adders, the former being frequently kept for the purpose of keeping down the rats and mice, which are a great scourge in many parts of Queensland. Wild pigs are common here.

We had a nice buggy drive to the Annan River, but the banana plantations there were by no means up to my expectations. The river is fairly wide, and is frequented by lots of very fine fish (which the natives obtain by spearing), as well as large crocodiles, *C. porosus*, with a smaller and harmless species. In driving from Cooktown to this place we passed through a dry, Australian type of country with lots of dead trees, upon which I was greatly surprised to see fine specimens of orchids, mostly, I should say, Dendrobiums, but how these lived and thrived on such dry material was a puzzle to me.

We saw here little of the real jungle, but seeing some fine pendent Lycopodiums, which had been gathered, at once convinced me that plenty of jungle must exist somewhere in the neighbourhood. The country between the Annan and Bloomfield Rivers is the home of the Tree-climbing Kangaroo and the so-called Striped Opossum, with swarms of ants everywhere. When at the Annan River I obtained a specimen (dug up out of the mud by Billy, Mr. Olive's blackfellow) of a singular fish, the Tree-climbing Perch, an ugly-looking beast which I was told climbs, or rather shuffles, to a considerable height up the Mangrove stems, but only when these trees are growing at a considerable incline. I made arrangements to procure a good series of this fish, together with some marvellous new worms, and when these reach me they will be presented to the National Museum.

I have already mentioned having met Mr. Gibson, one of the good old hardy Scotch pioneer squatters, and who by the way is uncle to Mr. T. G. Sloane, the well-known entomologist of New South Wales and an old member of our Club, and from Mr. Gibson I obtained the following interesting particulars. Riding one day in company with two stock hands, Mr. Gibson's attention was directed to some smoke and a peculiar smell of burning flesh, and on seeking the cause he found a small camp of blacks;

the latter, some of whom had been engaged in roasting a young gin who had been previously stuffed with bananas, immediately decamped. Our friends, being unprepared for the spectacle of such refinement in native cookery, were anxious to ascertain whether the woman had been killed or had died a natural death, but Mr. Gibson was unable to find out this. It is, however, well known to the settlers of these parts that cannibalism was largely practised among the natives, and this may have been a case in point.

This place is a perfect paradise for the insect collector, and I could devote pages to the insect and other fauna of these charming places.

A eucalyptus known as the "Blood-wood" is very common about here, and also Pandanus, Eugenias, and many other plants known only to the botanist. The Cocoanut trees had suffered severely, owing to the late destructive hurricane, which levelled to the ground two-thirds of the houses in Cooktown, and made havoc of the once pretty gardens, robbing the place of much of its former beauty.

I had almost forgotten to mention a lovely climber which I saw growing over a shed at Kuranda. It was a species of Bauhinia, and when in flower, as we saw it, was a sight not soon to be forgotten. It seemed strange to one so accustomed to being among plants that I knew so few of the fine-foliaged plants of this part of North Queensland, but their robust and altered appearance may largely account for this. It would almost appear as though a huge slice of Indo-Malayan jungle had been transferred by Nature to these favoured spots, for outside this belt the country appears to be of quite an Australian type, but I greatly missed the splendid tree-ferns of portions of our own State. Some splendid specimens of *Bignonia venusta* and other species are to be seen here. I was handicapped in not being able to get about, being at the time hardly able to crawl, and thus missed the opportunity of collecting material for a longer and more interesting paper.

Having taken leave of my kind old friends, the Olives, who had made our stay as enjoyable as possible, we left Cooktown, with its cool climate, most reluctantly in the s.s. *Aramac*—the Commander, Captain Thompson, being a gentleman of well-known scientific leaning and attainments, and to whom I am indebted for many past favours—and rejoined the *Wyandra* at Cairns. Upon my return to Cairns I heard sad accounts of the wholesale destruction of splendid cedar trees in the rich forest of the Atherton district, a state of affairs not unknown in our own State, and one greatly to be deplored. As we came southwards the sea in some parts inside the Barrier Reef, presented a singular appearance, being greatly discoloured by a brown "scum," which, Captain Grahl informed me, had been washed off the reef,

and in appearance somewhat resembled the brown (dead) confervæ of our ponds.

I was sorry at not being able to visit the Australian Museum in Sydney on my way back, as also the fine Technological Museum, but, as some solace, was pleased to see the Curator of the latter, Mr. R. Baker, F.L.S., who, together with some of the Australian Museum staff, called at my lodgings. Unfortunately, my old friend and colleague, Mr. W. W. Froggatt, F.L.S., F.E.S., was also absent from Sydney, being away on important business on behalf of the Governments of Victoria, New South Wales, Queensland, and South Australia, visiting Honolulu, North America, Europe, and other places, in search of further information in connection with the existence of parasites of the Codlin Moth, Fruit-fly, &c.

Melbourne was duly reached after a fair weather passage of nearly 5,000 miles. In conclusion, I cannot speak too highly of the steamships *Wyandra* and *Aramac* to anyone travelling in these waters, everyone on board being most kind, which to an invalid especially was most gratifying.

Although at the time of the trip I was not in good health, many pleasant recollections are stored up in my memory, and will furnish material for reflections which are a source of pleasure known only to naturalists and other lovers of Nature. The magnificent Whitsunday Passage, Hinchinbrook Channel, and other places through which we passed are too well known to need any further description by me, but the sights seen will long remain in my memory.

Extinct Birds.—Some idea of the character of the Hon. Walter Rothschild's recently published work on extinct birds can be gathered from the notes and illustrations in the *Illustrated London News* of 16th November, 1907. Few people realize how many species of birds have totally disappeared from the face of the earth during the last three or four hundred years—the time man began to take notice of the wonders of nature around him, and record the appearance and habits of the various members of the animal kingdom. The author has made diligent search through old MSS. and books, and, by bringing his own intimate knowledge of ornithology to bear on them, has presented a series of plates of birds which are no longer existing which will stand close examination. That the author is animated by a desire to save further extinction of feathered friends is shown by his having leased the coral atoll or island of Aldabra, in the South Indian Ocean, simply to protect the colony of the Abbot's Ibis, which still exists on the island, and nowhere else in the world. We trust his example will rouse others to do their best to save the native fauna and flora. May it be long before the Lyre-bird claims a plate in such a book.

The Victorian Naturalist.

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FIELD NATURALISTS' CLUB OF VICTORIA.

The ordinary monthly meeting of the Club was held in the Royal Society's Hall on Monday evening, 9th March, 1908.

The president, Mr. G. A. Keartland, occupied the chair, and about 63 members and visitors were present.

REPORTS.

An interesting report of the Club's excursion to Mt. William, Lancefield, on Saturday, 22nd February, under the leadership of Mr. E. E. Johnson, was given by Mr. T. S. Hall, M.A. A series of lantern views depicting some of the quarries where the aboriginals had manufactured their stone implements, and of other features of interest in the district, were shown by Messrs. T. S. Hall and J. H. Harvey. During the remarks which followed, Mr. F. G. A. Barnard stated that the success of the trip was due to a great extent to the cordial co-operation and assistance given by Messrs. G. K. Donaldson, M. E. O'Brien, A. E. Brisbane, J. T. Guthridge, and E. E. Johnson, who did all in their power to make the trip as enjoyable and interesting as possible. He moved—"That a hearty vote of thanks be accorded the gentlemen named for their kind assistance during the visit." This was seconded by Mr. R. W. Armitage, and carried.

Mr. O. A. Sayce reported on the junior excursion to Heidelberg on Saturday, 7th March, the object being pond life. Twenty-two members attended, and an interesting and enjoyable afternoon was spent.

ELECTIONS.

On a ballot being taken, Miss Wrigley, 117 Racecourse-road, Newmarket, and Mr. Albert D. Harding, care of Huddart, Parker and Co., Melbourne, were duly elected members of the Club.

GENERAL BUSINESS.

Mr. O. A. Sayce introduced to the meeting Mr. Geoffrey Smith, of Oxford, who is at present devoting his attention to the study of the land and fresh-water crustacea of Australia and Tasmania. Mr. Thos. Steel, F.L.S., of Sydney, a former member of the Club, was also introduced by the president. Both gentlemen expressed their pleasure in being afforded an opportunity of attending the meeting, and were accorded a very cordial welcome by the members.

The President referred in terms of deep regret to the death of the late Dr. A. W. Howitt, C.M.G., D.Sc., F.G.S., for many years an honorary member of the Club, who died at his residence, Bairnsdale, Gippsland, on the 7th inst. He referred to the large amount of valuable work accomplished by the late Dr. Howitt, whose loss would be severely felt in scientific circles.

Mr. T. S. Hall, M.A., on behalf of the meeting, congratulated Mr. A. H. E. Mattingley on his election as a corresponding member of the Zoological Society of London.

PAPERS.

1. By Mr. E. Jarvis (communicated by Mr. J. A. Kershaw, F.E.S.), entitled "Life-History of the Butterfly *Heteronympha philerope*, Boisd."

The author described the early stages of one of the brown butterflies, *Heteronympha philerope*, which occurs sparingly in some of our mountain ranges. The larvæ, like those of several other species, feed at night on one of the native grasses, and so escape observation unless a close search is made for them.

Mr. J. A. Kershaw, F.E.S., spoke on the paper, which he stated displayed a great deal of patient observation on the part of Mr. Jarvis.

2. By Mr. R. W. Armitage, entitled "Notes on the Queensland Fire-fly Beetle, *Luciola flavicollis*."

The author detailed some observations he had made when at Kuranda, some 20 miles inland from Cairns, North Queensland, on the Fire-fly Beetle of that district. He said that he had come to the conclusion that the emission of light was not due to phosphorescent material, but rather to the development of nervous energy of a special and peculiar form.

3. By Mr. A. H. E. Mattingley, C.M.Z.S., entitled "A Night on the Lawrence Rocks."

The author gave a graphic description of a night spent on the Lawrence Rocks, situated to the south-west of Portland Bay, and some two or three miles from the mainland, the object of the visit being to study the nesting of the Dove-Petrel or Prion, *Prion desolatus*, as well as of the Fairy Penguins, Gannets, and other birds inhabiting the rocks. He was successful in making a number of interesting observations and in obtaining some excellent photographs of bird-life, which were reproduced as lantern views, and evoked considerable praise.

The President and Messrs. C. J. Gabriel, E. B. Nicholls, and R. W. Armitage spoke to the paper.

NATURAL HISTORY NOTES.

Musk Lorikeet.—Mr. T. S. Hall, M.A., referred to a discussion on a natural history note by Mr. A. D. Hardy at the previous meeting, during which some doubt was expressed as to the Musk Lorikeet, *Glossopsittacus concinnus*, being known in some districts as the "Green-Leek." Mr. Hall stated at the time that he believed the Musk Lorikeet was referred to in the Geelong dstrict some years ago as the "Green-Leek," and his statement had recently been confirmed by Mr. Mulder, of Geelong, and Mr. Johnson, of Lancefield, as regards the Goulburn Valley.

Mr. R. W. Armitage submitted several notes, which proved of considerable interest :—

1. Bronzewing Pigeon.—When a mile or so south of Cape Schanck, at 7.45 p.m. on 21st December last, I saw a Bronzewing Pigeon, *Phaps chalcoptera*, fly past the steamer towards the south-east, no doubt making for Tasmania. I kept a sharp look-out, but did not see any other Bronzewings fly past.

2. Mutton Birds.—When off Wilson's Promontory at 7 a.m. on 30th January last enormous numbers of Mutton-birds could be seen flying out to sea, as far across the water as the eye could distinguish. There must have been some hundreds of thousands, for they flew past the steamer in one continuous flight for more than half an hour. Occasionally large flocks would settle on the water, making immense dark-looking patches. Then all would rise at the one moment, appearing in the distance like a huge swarm of bees.

3. Scorpions.—When at Mount William, Lancefield, on 22nd February last, numbers of Scorpions were found on turning over the loose or partially embedded stones on the top of a hill. These, on examination, appear to agree with *Urodacus abruptus*, Pocock, described some years ago in the "Annals of Natural History." Many of them were accompanied by young ones, which in every instance were crowded on the back of the mother, who defended her young when threatened by danger. The female Scorpion exhibited this evening had twenty-two young crowded on her back. These were pure white, with black eyes, when captured, but have since turned a brownish colour, and though fed while in captivity, have not grown much.

4. Pennant's Parrakeet.—When near Mt. William, Lancefield, on February last, a flock of about a dozen Pennant's Parrakeets, *Platycercus elegans*, were observed busily engaged at some plants of the Native Cranberry, *Styphelia humifusa*. Close examination showed that they had nipped off the flowers just at the base of the corolla, doubtless to feast on the nectar stored therein.

A Fungus Growth.—Mr. J. A. Kershaw, F.E.S., drew attention to his exhibit of a large piece of honeycomb, in which the cells were completely filled and to a great extent entirely replaced by a leathery fungus. The comb was taken from a hollow tree on the Dandenong Ranges by Mr. R. C. Chandler, by whom it was presented to the National Museum.

EXHIBITS.

By Mr. R. W. Armitage.—Female Scorpion, with young, in illustration of his natural history note ; specimens of Fire-fly Beetle, *Luciola flavicollis*, in illustration of his paper.

By Mr. Jas. Armitage.—Photographs of scenes on Snob's Creek, Rubicon and Goulburn Rivers, near Alexandra, and views in and around Jamieson.

By Mr. F. G. A. Barnard.—Unfinished stone tomahawks obtained during excursion to Mount William, Lancefield.

Mr. C. F. Cole.—Stuffed specimen of Grey Goshawk (female), *Astur cinereus*, Vieill., from Upper Hawthorn (26/2/70) ; also stuffed specimen of young male Platypus, *Ornithorhynchus anatinus*, from Goulburn River, Nagambie.

By Mr. C. J. Gabriel.—Shells obtained by dredging off Point Cook, Port Phillip Bay, viz. :—*Choristodon rubiginosus*, Ad. and Ang. ; *Pecten medius*, Lam. ; *Chione disjecta*, Perry ; and *Nucula obliqua*, Lam. All of these were obtained in living condition, being the first occasion on which the first-named has been obtained alive in Victoria. Also *Bulla australis*, Gray ; *Cancillaria granosa*, Sow. ; *Haminea cuticulifera*, Smith ; *Philine angasi*, Crosse ; *Sigaretus zonalis*, Q. and G. ; and *Turricula scalariformis*, Ten.-Woods.

By Mr. J. Hogland.—Violin, cribbage board, and walking sticks made from the different woods found in the Cape Otway district.

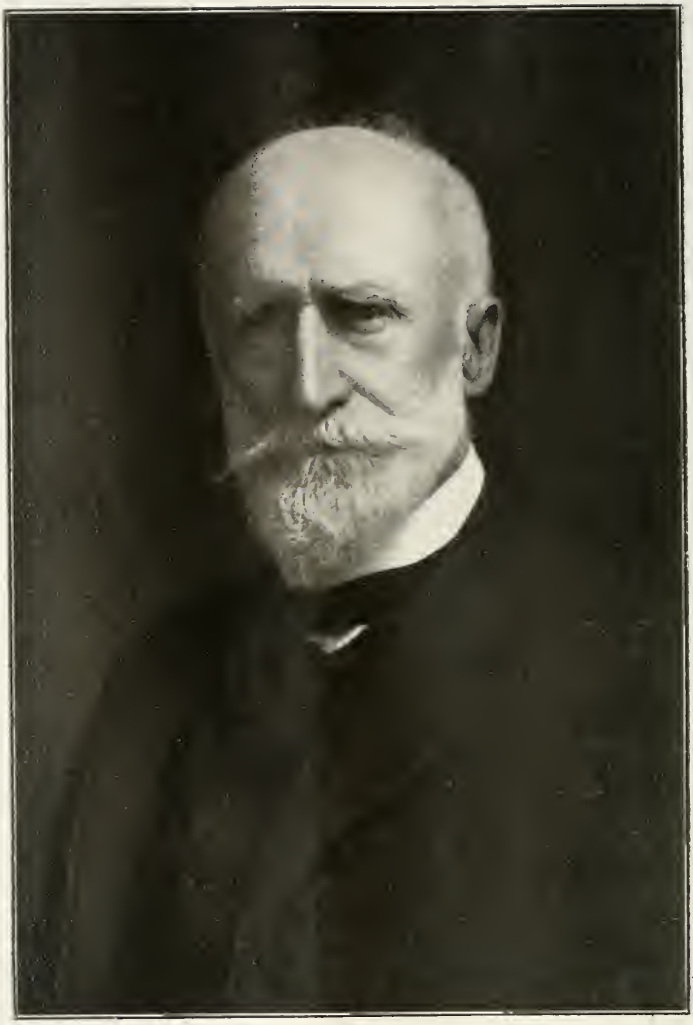
By J. A. Kershaw, F.E.S., for Mr. E. Jarvis.—Imago, larva, pupa, and eggs of butterfly *Heteronympha philerope*, Boisd., in illustration of his paper.

By J. A. Kershaw, F.E.S., for National Museum.—Large piece of honeycomb, the cells of which were completely filled and to a great extent entirely replaced by a leathery fungus, taken on Dandenong Ranges by Mr. R. C. Chandler ; also curious plant growth, said to be stem of Mistletoe, from South Africa.

By Mr. J. S. Kitson.—Specimen of *Goniocidaris tubaria* found on beach at Shoreham, near Flinders.

By Mr. F. P. Spry, for National Museum.—Imago, larva, pupa, and eggs of butterfly *Heteronympha philerope*, Boisd. Larva of same obtained by Mr. G. A. Waterhouse, B.Sc., at Macedon in November, 1907.

After the usual conversazione the meeting terminated.



ALFRED WILLIAM HOWITT.

ALFRED WILLIAM HOWITT.

THE death of Dr. Howitt has removed from our midst one who was at once the oldest and most distinguished scientist in Australia.

Alfred William Howitt was born at Nottingham in 1830. He was the son of William and Mary Howitt, whose names, during at least half of the nineteenth century, were well known in literary circles in Great Britain. His father, who was a native of Heanor, a delightful little village in Derbyshire, commenced his literary career at the early age of thirteen, when he published in the *Monthly Magazine* an ode entitled "An Address to Spring." He was by profession a chemist, and to this fact may perhaps be attributed the leaning of his son towards a scientific life. The father finally devoted himself to literature, the son to science. Both William and Mary Howitt were ceaseless workers, in evidence of which it may be stated that the name of the latter as author, translator, or editor is attached to no fewer than one hundred works, and all who know what their son has done will realize that he inherited to the full this power of constant, tireless work. It is very interesting also to note, in view of what the latter did in regard to Australian exploration, that in 1823 William and Mary Howitt, soon after they were married, made a pedestrian tour through Scotland, at that date an almost unheard-of achievement. In 1840, when Alfred was ten years old, they went to live in Heidelberg for the benefit of their children's education. Here William Howitt published a book, entitled "The Rural and Domestic Life of Germany"—a work which the *Allgemeine Zeitung* described as the most accurate account of that country written by a foreigner. Both William and Mary Howitt possessed great powers of observation and considerable linguistic ability, and both of these powers were strongly developed in the son.

In June, 1852, William Howitt, accompanied by his sons, Charleton and Alfred, set sail for Melbourne, the ostensible object of this trip being to see his brother, Dr. Godfrey Howitt, who was then settled as a medical man in Melbourne. Doubtless a desire to see new countries, and especially one reports of whose fabulous riches were then reaching England, acted as a further stimulus to induce him to make what was in those days a bold and adventurous trip. The results of this visit were that the father published the well-known book "Land, Labour, and Gold; or, Two Years in Victoria," and the son settled in Australia and gave to the world work which, in ethnology at least, will always rank as of primary importance.

But few of the admirers of Charles Reade's celebrated novel, "It is Never Too Late to Mend," are aware that the local colouring of the book was derived from William Howitt's work, but this is an actual fact. To quote the words of Charles Reade

himself :—" To avoid describing Hyde Park," he wrote to William Howitt, " and calling it Australia, I read some thirty books about that country ; but yours was infinitely the best. . . . Your vivid scenes took hold of me ; and your colours are the charm of many of my best pages . . . . the thunder of the cradles, the bottles sown broadcast over the land, with other happy touches of the sort, and one divinely felicitous phrase—'the sentences measled with oaths and indelicate expressions.' In short, I have taken from you far more than I could have taken with decency if our two works had not been heterogeneous." William Howitt's book is by far the most interesting and brightly written account of the many dealing with the early days of Victoria.

After a voyage out of one hundred and two days they reached Melbourne, purchased a cart and two horses, and started up country for the Ovens diggings, experiencing to the full all the difficulties of travel in a wild country, until, after an arduous journey of nearly two months, they reached the field, only to find some twenty thousand people already camped there. William Howitt was at least as much interested in studying people and nature as in digging for gold, though he and his party did their full share of prospecting, moving about in the approved style from place to place—from the Ovens to the Yackandandah, then back again and on to the Murray at Albury, which then consisted of a number of inns, a shop or two, a bakehouse, and a few wooden huts. After a time they returned to Melbourne, where " Canvas Town " had sprung into existence since they had left. In 1854, after several months further wandering and visits to Ballarat, Bendigo and Geelong, William Howitt, with his son Charleton, returned to England, leaving Alfred, then twenty-four years of age, in Melbourne. By this time the latter was not only an accomplished bushman, but, endowed naturally with keen powers of observation, he had begun to study nature as no ordinary bushman does. For some time he remained near Melbourne, farming on land near Caulfield that belonged to his uncle, Dr. Godfrey Howitt, who then lived at a house which still stands—a relic of those old days when Melbourne was a mere township—at the far eastern end of Flinders-lane. Here also the Doctor was forming his well-known entomological collection, which subsequently he left to the University, for the Doctor's instincts were scientific, just as were those of his nephew. And here also the latter must have often met all who were interested in natural history in those early days. The humdrum life of a farmer was not, however, likely to be congenial to Alfred Howitt, and, accordingly, he turned to the more exciting and varied work of cattle-droving, bringing down mobs of cattle from the Murray to Melbourne. Curiously enough, it was on one of these occasions that he chanced to meet Lorimer Fison, who was also working up country. They met and parted, little thinking that

in future years they would be so closely linked together in their work.

This was the great era of exploration in Australia, more especially at that time in South Australia. Sturt had done splendid work, M'Douall Stuart was pressing northwards from Adelaide, and Warburton had reported in favourable terms upon the country, then but little known, lying towards the centre of the continent in the region of Lake Eyre. It was, indeed, the discoveries of Warburton, who had the good fortune to cross the country in an exceptionally favourable season, that drew the attention of Melbourne pastoralists to what was then regarded as a "promised land." By this time Alfred Howitt was well known as a capable, careful, and fearless bushman, and in 1859 he was sent out at the head of a small party to explore the "Far North," and to select on behalf of a Melbourne syndicate a tract of country suited for raising cattle.

His experience was that of so many other travellers in Australia. Where one explorer had found water and grass in abundance, the next one, travelling over the same area, met with nothing but sterility. To use Howitt's own words—"In time we worked our way to Strangways Springs . . . . but it was not the kind of country that we wanted." After travelling 1,500 miles on horseback, and bringing all his party safely back, he returned to Melbourne. "Such," he says, after describing the barren nature of the country, "was my apprenticeship in Central Australia, which in the near future was to stand me in good stead in a far more important expedition."

After returning to Melbourne, and gaining more experience as the manager of a station near Hamilton, he was chosen to take charge of a party of picked miners sent out by the Government of Victoria at the instance of Mr. Angus M'Millan, the pioneer of Gippsland. His object was to explore and prospect the rugged, mountainous country around the sources of the Mitchell River, and the result of this work was the opening up of goldfields on the Crooked, Dargo, and Wentworth Rivers. It was during this expedition that he first became really interested in the question of the eucalypt trees, and to the last he retained his interest in this subject, studying them minutely, until, from practical experience in various parts of Australia, he acquired an unrivalled knowledge of this characteristic feature of our Australian flora. He was a rare example of a man who possessed both what is called a practical and at the same time a thorough scientific knowledge of subjects such as this. He knew the eucalypts of Victoria, from a scientific point of view, as well as anyone, including even the late Baron von Mueller, and at the same time he was thoroughly acquainted with their value from a practical point of view. And here I may say that he was an expert in woodwork. This was his favourite pastime and his hobby, and in his workshop

he produced articles, made from Australian woods, which any carpenter, or even cabinetmaker, would have had no hesitation in declaring to be the work of a man who knew his trade.

In 1860 the Burke and Wills expedition was fitted out in Victoria, its object being to cross the continent from south to north. A rude stone obelisk in the Royal Park, standing close to what is now one of the main thoroughfares leading into Melbourne, but, at that time, far beyond the city bounds, marks the spot where the enthusiastic citizens bade farewell to the two explorers, who were destined never to see Victoria again. The story of the expedition and its disastrous ending is well known. Burke was evidently emulous to outdo M'Douall Stuart, who was then leading his fourth expedition north from Adelaide, in the attempt to cross the continent, and Burke was determined at all risks to be the first to do this. More than forty years later, when dealing with this expedition, Dr. Howitt wrote as follows :— "Taking everything into consideration, I think that the unfortunate occurrence of mischances was due, primarily, to errors of judgment on the part of Burke, and that these arose because he did not possess that kind of knowledge which is absolutely necessary to enable even the bravest and most determined man to be the successful leader of such an expedition as was committed to his charge. . . . Unfortunately Burke had no experience of the work, and Wills, the best man Burke had, a man of noble character—who seems to have placed duty first—had not the special bush training which would have enabled him to see what course would be necessary, and also to speak with the authority given by knowledge. . . . It was he who really took Burke across the continent and brought him back to Cooper's Creek. Without Wills, Burke would have been absolutely helpless." This is the final word of the man who knew more about that ill-fated expedition than anyone, save those who perished and its one survivor, from whom he had the opportunity of learning its true story, while the events were yet quite fresh in his memory. It is not too much to say that, had Howitt been the leader the expedition would have been a brilliant success instead of a brilliant failure.

As month after month passed by and no news of the explorers reached Melbourne, it was decided to send out a search party, and of this Mr. Howitt was appointed leader. On the Loddon he met Brahé, who reported that Burke had left Cooper's Creek on the 16th December, 1860, accompanied by Wills, Grey, and King. Burke's instructions from the Melbourne committee were to "form a depot of provisions and stores at Cooper's Creek, and to make arrangements for keeping open a communication to the Darling or by way of the South Australian police at Mt. Serle." This he did not do. He left Cooper's Creek before his stores arrived, telling Brahé to wait there three months for him. Brahé

waited four months, and left the depot on the morning of 21st April, 1861, and on the very evening of that day Burke returned, with Wills and King—Grey had died a few days earlier. After a vain attempt to press southwards, Burke and his two companions returned to Cooper's Creek, and here Burke and Wills died.

As soon as Mr. Howitt heard Brahé's account of what had happened, he communicated with the Melbourne committee, and, after being reinforced, started northwards again, reached Cooper's Creek in September, rescued King and brought him safely back to Melbourne. Howitt returned in November and within two weeks he was once more leading a party into the interior, partly with the object of gaining more information as to the country lying around Cooper's Creek, but mainly that he might bring the remains of Burke and Wills down to Melbourne.

It was during this second visit, when he was free from the necessity of constantly pushing ahead every day, lest he should be too late to rescue any members of the expedition who might be yet alive, that Mr. Howitt began to study the native tribes with whom he came in contact, and here he gained his first insight into the social organization of the Dieri tribe.

After his return to Melbourne, in recognition of his sterling work, he was appointed Police Magistrate and Warden of the Goldfields in Gippsland—a post that he filled with conspicuous success during twenty-six years of incessant work, from 1863 to 1889, his headquarters being successively in Omeo, Bairnsdale, and Sale. The district under his charge extended from Wilson's Promontory to Cape Howe. He was living in what was then practically a wild, almost unexplored country, that was gradually being exploited by miners and settlers in search of land. Every year he travelled thousands of miles on horseback, and it was during these journeys that most of his botanical and geological observations were made. His capacity for work was phenomenal, and not a little of his reading was done on horseback.

It was some years after he had begun to accumulate notes before he actually published anything, his first paper being entitled "Notes on the Geology of Part of the Mitchell River Division of the Gippsland Mining District." This appeared in the "Progress Reports" of the Geological Survey of Victoria for 1874, in which also he had a second paper dealing with "The Geology of the Ovens District, with Remarks on the Deep Leads." From this time onwards he was a constant contributor, on questions dealing with the general geology of Gippsland and the microscopical examination of rocks, to the publications of the Department, the Royal Society of Victoria, the Australasian Science Association, and, occasionally, the *Quarterly Journal of Geological Science*.

Thanks to his early training in Germany, he was able to work effectually even in this remote part of Australia, and it is a

remarkable fact that before the Melbourne University had any scientific laboratories worthy of the name he was analyzing rocks and cutting sections of them in the little laboratory that he had fitted up for himself amongst the Gippsland mountains. Not only this, but he was in constant communication with the leading petrologists in England and Germany. It was during this period also that, more important still, he turned his thoughts seriously towards the study of the Australian aborigines, gaining the entire confidence of the members of the Kurnai tribe, with whom especially he came into contact, and by whom he was regarded as a fully initiated member of the tribe.

Dr. Lorimer Fison, who had for many years been living as a missionary in Fiji, where he had done most valuable work, had returned to Australia. He had become deeply interested in the studies of the great American ethnologist, L. H. Morgan, and, perceiving the fundamental importance of investigating the Australian aborigines, had written to the leading Australian papers asking for the co-operation of those who had a knowledge of the natives. By good fortune this letter was seen by Mr. Howitt, and, once more, the two men who years before had casually met on the banks of the River Murray, came into contact and formed a deep and loyal friendship, which was only terminated by the death of Dr. Fison at the close of last year. In 1880 these two workers published conjointly the volume "Kamilaroi and Kurnai," of which it may be truly said that it laid the foundation of the scientific study of the Australian aborigines, for it was in this work that, for the first time, we had given to us a detailed, accurate account of the social organization of Australian tribes. Other workers have extended our knowledge, but it was Howitt and Fison who laid the foundation and pointed out clearly the essential features of the beliefs, customs, and organization of Australian tribes.

In 1889 Mr. Howitt became Secretary for Mines in Victoria, and in 1896 he was appointed Audit Commissioner. During these later years all his spare time was spent in scientific work, but to those who knew him intimately and were able to appreciate justly his knowledge and capacity for research, it was a matter of deep regret that so much of his time should have to be spent on what was mere routine work, which a man of far less capacity could have done. Not only was this so, but his experience as a police magistrate, and his ripe knowledge, caused him to be appointed by the Government on commissions and boards of inquiry which entailed the expenditure of time and energy that might have been far better spent in scientific investigation. Meanwhile, however, he was quietly accumulating information for future use—looking forward to the time when he would be free from departmental work and able to devote himself entirely to research. In 1889 he published a valuable paper in the transac-

tions of the Royal Society of Victoria on "The Eucalypts of Gippsland," dealing with the variations of the different species, their distribution in relation to altitude and geological formations, &c. This was only an introduction to a more complete work which he hoped some day to publish. In 1891 he outlined, in a paper on "The Organization of Australian Tribes," the salient features in regard to this important and somewhat intricate question; this, indeed, was only one of a valuable series of memoirs dealing with the same subject, most of which were published in the journal of the Anthropological Institute of Great Britain from the year 1883 onwards.

In 1901 he retired from the public service of Victoria. Not the slightest notice was taken of his retirement, which was exactly what he himself would have desired, and the members of the service were probably quite ignorant of the fact that they were parting with a colleague who was without any doubt one of the most distinguished men who have ever held office in the public service of Victoria.

In the quiet seclusion of his picturesque home at Metung, on the shores of the Gippsland Lakes, he began to review and publish the results of his life's work in ethnology, botany, and petrology. He was not, however, able to do this without serious interruption. His peculiar knowledge and experience marked him out as the man most fitted to act as chairman of a Royal Commission on the coalfields of Victoria, and shortly after he had completed this work his wide scientific experience and knowledge again caused his appointment as a member of the inter-State commission dealing with the choice of a site for the future capital of the Commonwealth. Despite the time and energy that these commissions entailed, not only in travelling and judging the value of evidence, but in acquiring practical knowledge of the geology, water supply, and general conditions of the various localities proposed for the capital of Australia, he still continued his special studies. He had planned out three pieces of work. The first was to deal extensively with the organization and customs of Australian tribes, the second was a work on the eucalypts of Victoria, and the third was a study of the rocks of the Gippsland district, which he knew better than anyone else. He was destined to complete only one of these researches.

In 1904 he published "The Native Tribes of South-East Australia," a volume that comprised the work of 40 years, during which he had conducted his own investigations amongst the tribes of Central Australia and those of Gippsland, and had at the same time been in correspondence with workers in various parts of Australia. This work will ever remain a classic so far as the study of Australian aborigines is concerned.

In the same year, happy in the knowledge that at least this part of the task which he had set himself to do was well accom-

plished, he gave himself a respite, and with his daughter, Miss M. E. B. Howitt, who had for many years been closely associated with him in his work, paid a visit to the old world. Needless to say he was warmly welcomed there amongst the ethnologists, all of whom—and many of them old friends by correspondence—fully recognized the primary importance of his work. Amongst other honours paid to him, the University of Cambridge conferred upon him the degree of Doctor of Science. Much as he enjoyed his travels, it was with a feeling of relief that he turned his face once more towards Australia, and no sooner had he arrived than he set to work with renewed energy.

His desire to complete his ethnological work had necessitated for a time the laying on one side of his botanical and petrological studies, but he now returned to these with renewed vigour and interest. This was in 1905, and with all the intensity and keenness of a young man, he set to work, both in his study and out in the field, amongst the Gippsland mountains, to solve the problems that he had been at work upon for years.

In 1906 the honour of C.M.G. was conferred upon him, in recognition of his distinguished services both as a public servant and a scientist.

In 1907 he presided over the Australasian Science Association at its Adelaide meeting, his inaugural address dealing with his personal reminiscences of Central Australia and the Burke and Wills Expedition. In previous years he had been president of the ethnological and geographical sections, and was the recipient of the first Mueller medal awarded in recognition of scientific work dealing especially with Australian problems.

On his return in January he settled down once more at Metung, the "even tenor" of his life being broken by one or two visits to Melbourne and an expedition amongst the mountains of the Omeo district in connection with his petrological and geological investigations. He was so young and fresh and so keenly interested in his work that when one was discussing matters with him it was difficult to realize that he was really a veteran, whose experience dated back to the early "fifties" of the last century. In December, 1907, the news came from Metung that he was seriously ill, but he seemed to recover, and for a time it appeared as if the danger had passed, and he might once more return to his work, but this was not to be, and towards the close of February of this year it became evident that the end was near. It was characteristic of the man that when he was told that his illness was serious, the one desire that he expressed was that he might be able to complete a special piece of work on which he had recently been engaged. He had, meanwhile, been removed from Metung to the home of his son at Bairnsdale, and there, on the evening of Saturday, 7th March, he passed away.

In future years the name of Alfred William Howitt will be held

in remembrance as that of a man who, in the early days of Australia, did yeoman service in the cause of science, and in one particular branch—that of ethnology—accomplished work which will always rank as of primary importance. To the public of Victoria he was known as the man who rescued the remnant of the Burke and Wills Expedition, but to those who had the privilege of knowing him personally this was merely an episode in the life of a man of simple and noble character, whose one aim was a ceaseless and tireless search for truth. W. B. S.

"A Guide to the Study of Australian Butterflies."—A popular work on the butterflies of Australia has long been wanted, and in the volume under notice Mr. W. J. Rainbow, F.L.S., F.E.S., Entomologist to the Australian Museum, Sydney, has endeavoured to enlist the sympathies of lovers of those delicate creatures known as butterflies, and tell them something about the life-histories of their favourites. Much yet remains to be told, and the volume shows in what direction there is yet work to be done. Mr. Rainbow has not aimed at giving a complete work on the butterflies of Australia, but rather such a work as is always required by the beginner in any branch of study, and, therefore, every butterfly which has been recorded for Australia has not been included, only those of which something is known about their earlier stages. An interesting introduction gives a general glance at the four stages in the life-history of a butterfly, while the following chapter contains a number of useful instructions in collecting, preserving, and breeding specimens. Six chapters are then devoted to an account of the principal species of the five great families of Australian butterflies. In these all stages of the various species are dealt with at length, a vast amount of information given in a popular way, and, as the letterpress is interspersed with numerous illustrations, the reader's interest is gradually excited, so that he feels he would like to go out in the field and find a caterpillar, and thence work out its wonderful life-history. A useful glossary of the technical terms used is given, together with a list of the butterflies figured, numbering about 104. In addition to these illustrations, 184 figures are given of eggs, larvæ, or pupæ of various species. The volume is well indexed, but we still think that, though a popular work, a systematic index showing at a glance the arrangement of the families and species dealt with should have been included. A frontispiece by the three-colour process and six half-tone plates lend additional interest to the illustrations, and finally the publisher, Mr. T. C. Lothian, is to be congratulated on the printing and get-up of the volume, which we trust will have a ready sale, and as the price fixed—three shillings and sixpence—is not exorbitant it should find a place on every naturalist's bookshelf.

CONTRIBUTIONS TO THE FLORA OF AUSTRALIA.

No. VIII.*

By Alfred J. Ewart, D.Sc., Ph.D., F.L.S., &c., Government Botanist and Professor of Botany at the Melbourne University, assisted by J. R. Tovey, First Herbarium Assistant.

(*Read before the Field Naturalists' Club of Victoria, 10th Feb.*, 1908.)

Acacia glanduligicarpa, F. M. Reader—Leguminosæ; *Vict. Nat.*, xiii., p. 146 (1896).

Many specimens of this plant have been referred in the past to a variety of *A. montana* with short, broad, falcate phyllodia, instead of the normally elongated ones. Although the species appears to be valid on the present evidence, it is certainly more closely allied to *A. montana* than to *A. obliqua*, although the shape of the phyllodia is very different. The possibility of a hybrid origin of this species must be borne in mind. For the present, assuming it to be valid, the range must be extended to South Australia (Yorke Peninsula, O. Tepper) and the Wimmera district. Specimens of it have been variously referred to *A. montana* (C. Walter), to *A. montana*, var. (Luehmann), and to *A. armata*, spineless form (F. Reader).

Cladophora crispata (Roth), Kg., Darebin Creek, Victoria.

A form of this New Zealand alga, identified by Major Reinhold. Mr. A. D. Hardy informs me that he has found the same plant in backwaters of the Yarra, but that the species has not been recorded for Victoria.

Pultenaea Gunnii, Benth., var. flava, n. var.†

A variety with yellow flowers. Wandin, P. R. H. St. John. October, 1907.

Naturalized Aliens.

Many of the plants on this list have long been recognized, but not recorded. A complete list will be issued shortly.

Agropyrum caninum, Beauv., Gramineæ; Goulburn, C. Walter, 1902.

Agropyrum repens, L., Gramineæ; widely spread.

Agrostis stolonifera, L., Gramineæ; Goulburn, C. Walter, 1903.

Andropogon erianthoides, F. v. M., Gramineæ; Shepparton, C. Walter, 1900. A native of N.S.W. and Qld.

Apera spica-venti, Beauv. (Agrostis), Gramineæ; Goulburn, C. Walter, 1903.

*No. VII. in Proc. Royal Soc. of Vict., vol. xx., p. 125, 1908.

† Or a sub-variety of *P. Gunnii* itself, if this species is reducible to a variety of *P. stricta*.

Arctium Lappa, L., Compositæ, Burdock ; near Melbourne, A. N. Pearson (1901) ; shire of Glenelg (1905) ; Casterton (1906), F. M. Reader ; and other localities.

Avena pratensis, L., Gramineæ ; Gippsland, C. Walter, 1898.

Avena pubescens, L., Gramineæ : Goulburn, C. Walter, 1900.

Bouteloua oligostachya, Torrey, Gramineæ ; Goulburn, C. Walter, 1902.

Brachypodium pinnatum, L., Gramineæ ; Goulburn, C. Walter, (1900) ; Dookie, H. Pye (1906).

Brachypodium sylvaticum, Beauv., Gramineæ ; Goulburn, C. Walter, 1900.

Bromus arvensis, L., Gramineæ ; Goulburn, C. Walter, 1900.

Bromus asper, Murray, Gramineæ ; Goulburn, C. Walter, 1900.

Bromus inermis, Leys, Gramineæ ; widely spread in Victoria.

Bromus racemosus, L., Gramineæ : Gippsland, C. Walter, 1887 ; and other localities.

Chenopodium vulvaria, L., Chenopodiaceæ, "Stinking Goosefoot ;" introduced with impure agricultural seed, and now widely spread.

Deschampsia flexuosa, Trin. (Aira), Gramineæ ; Goulburn, C. Walter, 1900.

Elymus arenarius, L., Gramineæ ; Queenscliff (1878) ; Dimboola (1899), F. M. Reader ; Portland, C. Walter (1897).

Erigeron canadense, L. (Compositæ) ; widely spread in Victoria.

Festuca elatior, L., Gramineæ ; Victoria, widely spread.

Festuca gigantea, Villars, Gramineæ ; Goulburn, C. Walter, 1904.

Festuca loliacea, Huds., Gramineæ ; Goulburn, C. Walter, 1902.

Festuca myurus, L., Gramineæ ; Goulburn, C. Walter, 1902.

Festuca ovina, L., Gramineæ ; Goulburn, C. Walter, 1902 ; also other localities.

Festuca rubra, L., Gramineæ ; Goulburn, C. Walter, 1902.

Fumaria officinalis, L., var. capreolata, L. (Fumaria capreolata, L.), Fumariaceæ ; Moreland, F. M. Reader, 1885.

Fumaria officinalis, L., var. densiflora, D. C. (Fumaria densiflora, D. C.). Fumariaceæ : near Murtoa, F. M. Reader, 1892.

Galenia pallens, Walp., Ficoideæ ; Geelong, Williamson, 1906.

Lycium horridum, "Horrid Box Thorn," Solanaceæ ; originally introduced for hedges, but now widely spread in Victoria. Proclaimed under the *Thistle Act* for the whole State, 1907.

Malva verticillata, L., Malvaceæ ; shire of Dimboola, F. M. Reader, 1900.

Melica uniflora, Retz., Gramineæ ; Goulburn, C. Walter, 1902.

Milium effusum, L., Gramineæ ; Goulburn, C. Walter, 1902.

Molinia cœrulea, Moench., Gramineæ ; Goulburn, C. Walter, 1902.

Ononis repens, L., Leguminosæ ; Western Port, February, 1886.

Oryzopsis miliacea, Benth. and Hook., Gramineæ; widely spread in Victoria.

Paspalum dilatatum, Poir., Gramineæ; naturalized by cultivation in Victoria.

Pennisetum macrourum, Trin., Gramineæ; Port Phillip, C. Walter, 1904; county of Follett, F. M. Reader, 1908.

Phalaris arundinacea, L., Gramineæ; Goulburn, C. Walter (1902); Camperdown, per Department of Agriculture (1905).

Phalaris cœrulescens, Desf., Gramineæ; near Melbourne, C. Walter, 1904.

Poa alpina, L., Gramineæ; Snowy River, Victoria, C. Walter, 1904.

Poa compressa, L., and Poa nemoralis, L., Gramineæ; both widely spread in Victoria.

Polygonum persicaria, L., Polygonaceæ; Victoria, J. Knight, 1907.

Senecio Jacobæa, L., Ragwort, Compositæ; widely spread in Victoria, proclaimed under the *Thistle Act* for seven shires.

Setaria verticillata, Palisot, Gramineæ; originally cultivated, but now widely spread in Victoria.

Setaria viridis, Palisot, Gramineæ; Setaria viridis, var. imberis, Palisot. Both type and variety widely spread in Victoria.

Trifolium hybridum, L., Leguminosæ; naturalized by cultivation in Victoria.

Trifolium incarnatum, L., Leguminosæ; widely spread in Victoria.

Trisetum pratense, Pers. (Avena flavescens, L.), Gramineæ; Goulburn, C. Walter, 1900.

Verbena venosa, Gill. and Hook., Verbenaceæ; Lake Wellington (1878); Hoddle's Creek, Gippsland, April (1902).

Exotics Not Yet Sufficiently Established to be Considered Naturalized.

Ambrosia artemisifolia, Mayn. and Walp., Compositæ; Wimmera, (1890); Tabilk (1905).

Andropogon saccharoides, Sw., Gramineæ; Victoria, very rare.

Antirrhinum Orontium, L., Scrophularineæ; Ballarat, Bacchus Marsh.

Arctotis argentea, Thunb., Compositæ; Hawkesdale, H. B. Williamson, 1903.

Argemone ochroleuca, Sw., Papaveraceæ; occasionally met with in Victoria.

Avena sterilis, L. "Barbary Oat," Gramineæ; Dimboola, Reader, 1902.

Borago officinalis, L., Borragineæ; occasionally met with in cultivated and waste places in Victoria.

Carbena benedicta, Adans., Compositæ; North Ovens Shire, 1904.

Cenchrus echinatus, L., Gramineæ, Victoria; occasionally introduced with grass seed.
Centaurea cyanus, L., Compositæ; near Melbourne, F. M. Reader, 1884.
Charieis heterophylla, Cass., Compositæ; Victoria, an escape from gardens.
Cleome graveolens, Rafin, Capparideæ; North-West Victoria, G. Innocent, May, 1906.
Conringia orientalis Don. (Erysimum orientalis, Mill., R. Br.), Cruciferæ; Wimmera, F. M. Reader, 1903.
Cyperus vegetus, Willd., Cyperaceæ near Melbourne, F. M. Reader, 1884.
Delphinium consolida, L., Ranunculaceæ; Dimboola, F. M. Reader, 1898.
Digitalis purpurea, L., Scrophularineæ; occasionally met with in cultivated and waste places in Victoria.
Eragrostis major, Hook., Gramineæ; occasionally introduced with other grass seed in Victoria.
Grindelia squarrosa, Dunal., Compositæ; Kerang, 1905.
Hyoscyamus albus, L., Solanaceæ; Cashel, Victoria.
Ixia erecta, Berg., Irideæ; South Preston, F. M. Reader, 1885.
Lathyrus sativus, L., Leguminosæ; Victoria, an occasional escape from cultivation.
Leonotis Leonurus, R. Br., Labiatæ; near Brighton, Victoria, January, 1906.
Leontodon hirtus, L.; Wimmera, Reader.
Linaria genistifolia, Mill., Scrophularineæ; Red Jacket Creek, Gargurevich, 1874.
Linaria versicolor, Moench., Scrophularineæ; Red Jacket Creek, Victorian Alps, Gargurevich, 1873.
Linum gallicum, L., Lineæ; Warragul, Williamson, 1904.
Mesembryanthemum falciformis, Haw, Ficoideæ; Mentone, F. M. Reader, 1886.
Nothoscordum fragrans, Kunth., Liliaceæ; Victoria, occasionally met with as a garden escape.
Œnothera acaulis, Cav., Onagraceæ; Portland cliffs, H. B. Williamson, 1903.
Ononis spinosa, L., Leguminosæ; Victoria.
Oxalis purpurata, Jacq., Geraniaceæ; Cheltenham, F. M. Reader, 1885.
Pelargonium graveolens, L'Herit., Geraniaceæ; near Melbourne, F. M. Reader, 1881.
Phleum tenue, Schrad., Gramineæ; Warracknabeal, Reader, 1904.
Phalaris intermedia, Bosc., Gramineæ; Victoria, occasionally introduced with grass seed.
Pimpinella anisum, L., Umbelliferæ; Victoria, occasionally met with in cultivated and waste places.

Saponaria officinalis, L., Caryophylleæ ; Victoria.
Solanum heterandrum, Pursh., Solanaceæ ; Taminick, G. Lindsay, 1906 ; Lillimur district, 1908.
Trifolium supinum, L., Leguminosæ ; a garden weed, at Warracknabeal, F. M. Reader, 1904.
Trigonella fœnum-græcum, L., Leguminosæ ; Victoria, an occasional escape from cultivation.
Verbesina encelioides, Benth. and Hook., Compositæ ; Kerang, J. Moore, 1900.

Erroneous Records of Naturalized Aliens.

Arnoseris pusilla, Gaertn., in *Journ. of Pharm.*, 1887, evidently a wrong determination for Hedypnois cretica, Willd. We have no evidence of *A. pusilla* being naturalized in Victoria.
Bromus japonicus, Thunb., in *Vict. Nat.*, vol. xxii., p. 79 (1905), wrongly determined ; should be Bromus arenarius, Lab.
Cratægus Oxyacantha, L., in *Journ. of Pharm.*, 1887. The plant is cultivated in hedges, but is not otherwise naturalized, and seems to die out when left to itself. It may establish itself in the east of Victoria.
Galenia secunda, Sond., in *Vict. Nat.*, vol. xix. (1902), is Galenia pallens, Walp.
Medicago turbinata, Willd., in *Vict. Nat.*, vol. xix., p. 159 (1903), wrong determination ; should be Medicago hispida, Gaertn., var. inermis, Urb.
Melilotus arvensis, Wal., in *Journ. of Pharm.*, 1887. We have no evidence of this plant being naturalized.
Pisum sativum, L., Pea, in *Journ. of Pharm.*, 1887, is hardly a naturalized plant.
Thrinca hirta, Roth, in *Journ. of Pharm.*, 1887, is now Leontodon hirtus, L. It is not yet sufficiently established to be considered naturalized.

LIFE-HISTORY OF BUTTERFLY *HETERONYMPHA PHILEROPE*, Boisd.

By E. Jarvis.

(Communicated by J. A. Kershaw, F.E.S.)

(*Read before the Field Naturalists' Club of Victoria, 9th March*, 1908.)

This species occurs sparingly in the Gembrook district from the middle of February to the middle of March, the male insect emerging about a fortnight before the female, and being procurable in good condition until the end of February.

The larvæ, like those of allied species, are grass feeders, and at Emerald, and doubtless throughout the Dandenong

Ranges, feed principally upon the various forms of *Danthonia penicillata*, F. v. M., although probably not exclusively confined to this grass. They are onisiform in shape, and extremely sluggish in their habits, feeding at night, and hiding in the day near the roots of the food-plants, where they remain motionless, and when handled, offer scarcely any signs of life.

After feeding for about nine months they retire as deeply as possible among the blades of grass, and taking up a position in which the head is uppermost, spin a fragile silken dome overhead, in some cases nearly surrounding themselves with a thin web of silk, in the form of an imperfect cocoon, under which they remain for about a week before assuming the pupal state.

The young larvæ probably suffer much from the attacks of small plant-bugs, to which I attribute the decrease in numbers that occured during the first month or two when breeding them; for, although having no direct proof, I caught small bugs, introduced among the growing grass placed in the breeding cage, and have little doubt about their being responsible for the trouble. It seems just possible that the eggs may be deposited loosely among the grass, the close mat-like growth of which would favour their concealment, as the eggs when laid would fall between the blades and be effectually hidden in the position occupied by the larvæ when hiding in the day-time.

In support of this supposition I may say that in no case did my females of *philerope* attach their eggs either to growing grass of *D. penicillata* supplied, or the sides of the cage; whilst those of *H. banksii*, laying at the same time, attached them plentifully to the food-plant and to the sides and top of their breeding cage. On the other hand the flattened bases of the eggs would seem to imply their attachment to some surface.

Egg.—The egg is pale yellow, about 1 mm. in diameter, with sides slightly conical, very obtuse at the apex, and flattened base.

Larva.—The larvæ are hatched about the beginning of May (a month after the eggs are deposited), and when just out are pale yellow with light brown heads, and a few scattered rather long black hairs.

(It is interesting to note that my larvæ of *H. banksii* and those of *H. philerope* emerged on the same day, although the eggs of the former were laid six days later, and that the two species differ considerably even at this early stage, the larvæ of *H. banksii* being much lighter in colour, with black heads and shorter hairs.)

After the first moult, which took place about the middle of May, the larvæ were pale green, with darker dorsal line, thin light-yellow subdorsal lines, and pale-yellow line along spiracles. Head shining reddish-brown. Body somewhat onisiform, and thinly covered with short black hairs. Length, about 3 mm.

The second moult, occurring a fortnight later, occasioned a few slight alterations in colour. The line along spiracles disappeared, and the subdorsal lines became greenish-yellow; whilst the head assumed a more yellowish tinge, with face claret-coloured, and frontal margin of eyes white; and the anal segment was furnished with two short, pointed, fleshy appendages. Length, 5 mm.

On 6th November (about seven months after leaving the eggs) the general colour of larvæ was as follows:—Mottled-grey, with darker well-marked dorsal line edged with lighter grey; two less defined dark-grey subdorsal lines with lighter grey between them, and an interrupted dark-grey line along spiracles. First and second thoracic and anal segments pale reddish-brown, the latter terminating in two fleshy points. Ventral surface, light greenish-yellow. Head, greyish brown, covered with tiny tubercles; mandibles black and shining. Length, 17 mm.

The larva attains its full size about the end of January, the general colour undergoing little or no alteration, except that the spiracular line is then visible only as a row of dots, and the first and second thoracic and anal segments do not differ perceptibly in colour from the rest of the body. The fully-grown larva is onisiform in shape and 27 mm. long.

Pupa.—The pupa is short, thick, and square-looking, with very large and prominent eyes, the abdomen being somewhat compressed at its extremity, and terminating in a pointed hook, tipped with a number of minute spines. Wings, head, and thorax pale brownish-yellow, thickly scored with tiny detached brown lines, arranged in a complicated pattern of curves and streaks, and presenting an extremely beautiful appearance under the microscope, when the whole surface is seen to be covered with minute convolutions. The ventral surface is almost entirely occupied by the wings, and is characterised by two (sometimes six) conspicuous dark spots, placed one on each wing about the middle of the pupa, and when six are present near the point of the wings (the additional four occupying a position between the legs, and being arranged somewhat in the form of a square). Abdomen reddish-brown, thickly pitted with tiny spots of a darker colour, which also appear on the thoracic area.

Note.—The pointed hook at the end of the abdomen perhaps serves to anchor the pupa shell whilst the imago is emerging from it, and the minute spines at the point would doubtless aid in the attachment by becoming entangled in the web of silk, probably spun for this purpose.

THE

Field Naturalists' Club of Victoria.

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